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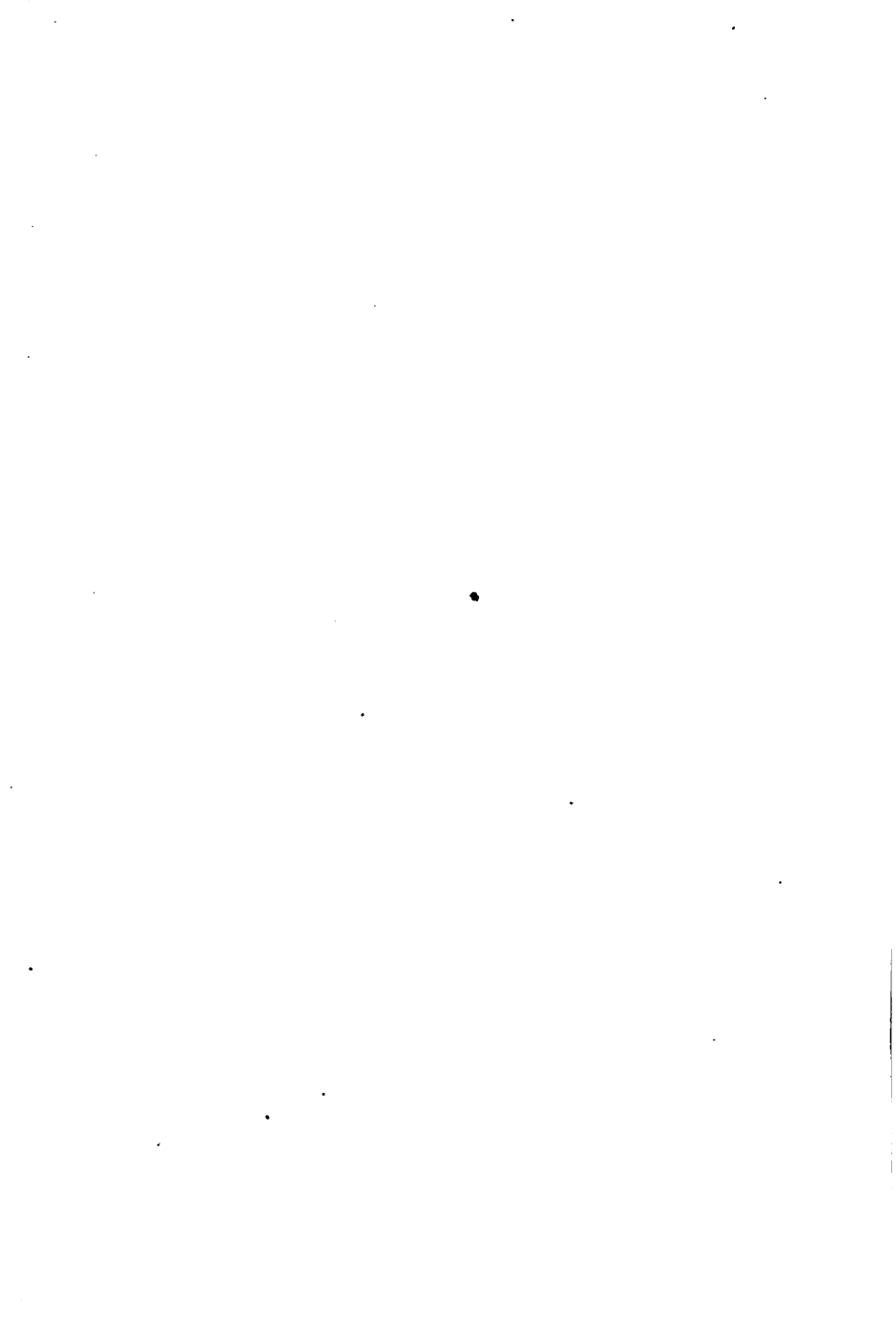
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ECLECTIC SCHOOL READINGS

SHORT STORIES

OF

OUR SHY NEIGHBORS

BY

MRS. M. A. B. KELLY

Author of "A Volume of Poems," "Leaves from Nature's Storybook," etc.



NEW YORK ·· CINCINNATI ·· CHICAGO
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KELLY'S SHY NEIGH.

W. P. 2

PREFACE.

It has been my aim in arranging the lessons for this volume to select chiefly such subjects, in the study of zoölogy, as treat of the most familiar objects to be met with in everyday life.

I have endeavored, also, to give so clear a description of the form, color, and habits of each type under consideration, that neither teachers nor pupils can be left at all in doubt as to the identity of a specimen when they have it in hand.

No one but a teacher can fully realize the joy and the satisfaction of a child who brings to her a moth, a caterpillar, or some other form of insect life, and proudly places it in the rank to which it belongs.

This assured success leads on to farther and farther investigation, and awakens an enthusiasm and a desire to become still better acquainted with the wonder world of nature.

A few short blackboard exercises every day will soon enable the child to master all the necessary technical names and terms involved in the study of these lower forms of life; and it is far better to learn the right names of things at the outset.

As far as it is practicable, each subject should be carried on in the way of an object lesson; and with a little

encouragement on the part of the teacher, every pupil in the classroom will gladly take part in adding to the zoölogical treasures of the school cabinet.

Inasmuch as insect life is supported almost entirely by the products of vegetation (there being only a very few insects that prey upon one another), I have thought it best to give that subject a liberal space in this volume.

It is now an accepted truth that there are at least ten insects to every plant, and that a large majority of them are harmful to vegetation.

This being the case, it seems highly important that a careful study be made both of the habits and of the habitats of these swift destroyers of plant life.

For valuable suggestions, as well as for aid in points of reference to the highest authorities, I am greatly indebted to many leading investigators in this line of work. Prominent among them are: Dr. L. O. Howard, United States Entomologist; Dr. J. A. Lintner, New York State Entomologist; Dr. A. S. Packard, Brown University, Rhode Island; Dr. Charles E. Beecher, Yale University, New Haven, Conn.; and Dr. D. S. Kellicott, Ohio State University.

Finally, that this volume may prove to be a helpful guide both to the teacher and to the pupil in their study of the more common types of animal life, is the sincere desire of

THE AUTHOR.

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SHORT STORIES OF OUR SHY NEIGHBORS.



THE ISABELLA MOTH.

ONE day, late in autumn, Ruth and her teacher were walking in the fields.

All at once Ruth cried out, "Oh, see what a queer furry worm! It looks like a wee bit of a clothes brush moving about."

Her teacher smiled.

"It is not a worm," she said. "It is sometimes called a 'wooly bear,' but it is more generally known as a 'caterpillar.'"



"Where did it come from?" asked Ruth.

The Larva.

"It was hatched from an egg laid by a mother moth; and some day it will be a moth itself.

"We must call it the larva of the moth now; for that is its right name. When we speak of more than one, we call them larvæ.

"The word 'larva' means 'a mask.' People sometimes wear a mask to hide their faces. Just so under this furry mask is hidden the form of an insect with four wings."

"I wish I could see its wings," said Ruth.

"Let us take it home with us, and put it into a glass-covered box; then we can watch for the coming wings," replied her teacher.

But when she tried to pick it up, it rolled itself into a little ball and slid from her hands.

Then she slipped a piece of cloth under it and wrapped it up so that it could not get away.

"Now look at this caterpillar closely," said the teacher, "and you will find that its body is marked with twelve furry rings; this fur is made up of stiff, short hairs.

"The first four rings and the last two are quite black; but the six rings that cover the space between these are of a chestnut brown,—a color that some people call a 'tan red.'

"Because of these stiff, spiny hairs and of the way in which it rolls itself up, it is often called the 'hedgehog caterpillar'; but when it lies out straight, it is more than an inch long, as you can see."

When they reached home they put their furry friend into a large box filled with clover leaves, dandelion, and plantain.

This was just what it liked, and it began eating at once; it had sharp jaws and it ate very fast.

Ruth and her teacher watched it from day to day; but after a few weeks it crept over its well-spread table without offering to taste its food.

At last it crawled slowly away toward one side of the box, rolled itself up like a ball, and fell into a sort of sleep.

If it was asleep, it took a very long nap; for it was now late in the fall, and it did not wake up again till the next spring.

And oh, what a hungry creature it was then! Why, it ate and ate every soft, green leaf that came in its way.

One day, Ruth placed a large, ripe, sour apple among the leaves. It began at once to gnaw the

smooth skin of the fruit; and it did not leave off until it had eaten a space around the apple as large as the width of its own body. Then it turned again to feast on the leaves, as before.



Larva on Apple.

But it soon grew tired of its food and acted as if it had not slept enough; so it wove a little blanket around itself and again went to sleep. This warm covering that it made was oval in shape, and of a dark-brown color.

And what is strangest of all, it was made of the hairs of its own body, fastened together by a silken thread which it spun out of a sticky gum that came out of itself.

That was indeed a home-made cradle, strong and warm and safe.

The teacher explained to Ruth that the caterpillar had spun for itself a cocoon, as its cradle is called, and that it was now a pupa, a word which means "baby."



The Cocoon.

"What a sleepyhead this baby moth is," said Ruth; "one would suppose that it might need

something more to eat. Now if there were two or more of them, what would you call them?"

"I would speak of them as the pupæ," answered the teacher.

"Larvæ and pupæ," said Ruth to herself; "those are not very hard words to remember."

"If you could peep inside of its cocoon," said the teacher, "you would find that it has cast off its caterpillar skin, and that it is now a very black infant, indeed. In fact, it changed its dress a good many times before it spun its cocoon; and every new dress was a warm, furry robe like the one in which you first saw it."



The Isabella Moth.

So the baby slept and slept for nearly a month; and then a strange thing happened. For one bright morning in June it awoke, and freeing itself from its prison cradle, it came forth a moth; and behold, its baby days were over!

It was not very strong at first, for its wings were weak, and were pressed close to its body; but in less than half an hour there was a great change.

The wings grew broader, while their color began to deepen; and all four of them were of a yellow-buff tinge, dotted here and there with black.

The front pair were marked with two or three brownish lines; but the hind pair were faintly tinged with red.

The body of the insect was of a deeper yellow than the wings, and was prettily marked with three rows of black spots, there being six spots in each row.

Ruth looked at it carefully. "It has six tiny, brown legs," she said. "And see its little short feelers! They are as yellow as the wings."



Antennæ of a
Moth.

"Those feelers are the antennæ of the insect," replied the teacher, "and when we speak of one of them, we call it the antenna. .

"You will not find that a hard word to speak, after you have said it once or twice; and it is always better to call things by their right names.

"You will see that these antennæ are round, and almost smooth; but the antennæ of most moths are feathered. They look like little plumes.

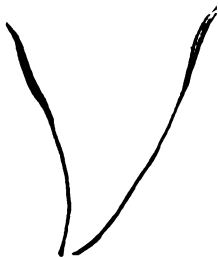
"Yet you can generally tell a butterfly from a moth by the antennæ; for those of a butterfly are threadlike, with a knob at the end. But both moths and butterflies belong to the same great family¹ of insects."

¹ Lep-i-dop'te-ra, scale wing.

"But where are the eyes?" asked Ruth.

"This insect has so many eyes that it would take you a long time to count them," said her teacher.

"There is an eye spot on each side of the head; and in each eye spot there are at least three thousand small eyes. These are called compound eyes, and besides these, there are two single eyes on top of the head."

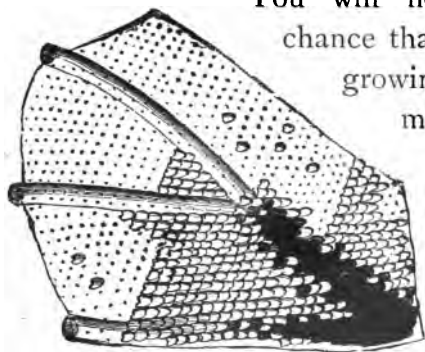


Antennæ of a Butterfly.

"No wonder then that it is so hard to catch moths and butterflies," said Ruth; "they see everything!"

"Look closely at the wings," said the teacher.

"You will never have a better chance than now; for they are growing stronger every minute, and the insect will soon fly away."



Wing Scales of a Moth.

"Oh, how pretty they are! They look as if they were covered with a mealy powder," said the little girl.

"They are covered with little scales that lap over one another like the scales of a fish," answered the

teacher, "and they are made fast to the skin of the insect by short, tiny stems; you will see that the whole body is covered with soft, downy scales, the same as the wings.

"This pretty little moth has lost its caterpillar jaws, and in their place there is a slender tongue; for now it will live on the juicy sweets of the flowers."

As she spoke, the insect rose and floated lightly away on its pretty buff-yellow wings.

"Ah, we have lost our queen," said the teacher; "she has gone to find her mate. I know she is a queen because her wings are of a deeper yellow than those of her mate.

"And now I will tell you why I call her a queen. She was named in honor of Princess Isabella, daughter of King Philip II. of Spain.

"This princess made a vow that she would not change her linen for three years. She no doubt had some good reason for it.

"At any rate, she kept her promise, and at the end of that time, her linen must have become fully as yellow as the wings of our little Isabella moth. So I think she is very well named; don't you?"

"She is indeed," replied Ruth; "and how strange that all this time we have had a noble queen hidden under the furry mask of a caterpillar!"

THE BIRTH OF A YOUNG LORD.

ONE very hot day in July, Mrs. Papilio¹ decided to give a select party.

And it was very select, I assure you; for none but the swallowtail family were invited.

Now this family are noted for their fine array, there being over three hundred different styles of dress among them; and had all the guests that were invited accepted, Mrs. Papilio's garden could not have held one half of them.

The list was headed with the names of Lord and Lady Asterias;² so they came early.

I was glad of this, for it gave me a very good opportunity to watch their movements; and so pleased was I with their fine appearance that I hardly cast a glance at any other member of the party.

My lord and lady came sailing in upon their four showy wings (the hind wings of each having tails), and seated themselves at once near a bed of parsley.

My lord was gayly dressed in a black swallowtail suit, banded with a double row of bright-yellow spots; and on each of the hind wings was a row

¹ Pa-pil'i-o. The Latin name of the butterfly.

² As-te'ri-as. The name of a peculiar species or kind of butterfly.

of seven blue spots between the outer and the inner line of yellow ones.

But this was not all ; for on the lower, inner edge of the tailed wings was an eyelike spot of orange yellow, having a black center.



The Swallowtailed Papilio.

He also had a double row of bright-yellow spots on his back that looked like gold buttons, and his shining black head was adorned with the same color.

Gold and black, black and gold,—ah, it was a fine suit indeed ! You should have seen it.

My lady was dressed in about the same style,

but she had not so many spots on her fore wings. I saw, at a glance, that she was a good deal larger than he; and I thought that maybe there had not been quite enough of the gilded band for both suits.

I noticed, also, that they each had six tiny legs, and that the hind pair had small spurs.

The antennæ were long and threadlike, and there was a knob at the end of each; they were not feathered like those of the moth.

As soon as my lady lit on the parsley bed, she folded all four of her wings together, so that they stood upright on her back. Then she slowly opened and closed them, as if trying to fan the hot July air.

Her mate lit very near her and did the same thing. But they did not remain quiet very long; for pretty soon my lady began to dart here and there about the parsley bed.

Then she stopped quite still, as if to say, "This is just the place for my eggs. I like it much better than the carrot, the parsnip, the celery, or even the sweet blossoms of the phlox."



Larva of Papilio.

"Ah," said I to myself, "so you are the mother of those hungry, pale green caterpillars that I find creeping about my garden, are you? I will watch those eggs of yours, my lady."

And I did watch them very carefully, but I did not have to wait long; for in a few days they were hatched, and oh, what tiny things the young caterpillars were!

Why, it would have taken ten of them, placed end to end, to make one inch in length.

But these babies, like their parents, were clad in fine array; and they had a number of pretty suits.

Their first suit was black, banded with white around the middle and bottom of the dress; but as they grew larger, this dress was cast aside for another.

And so they kept on, till they got the fourth suit; and this last outfit was very fine indeed. It was of an apple-green color, having black bands dotted with bright-yellow spots, and was much more showy than any of the other dresses that they had worn.

You would not wonder that they outgrew their clothes so quickly, could you have seen them eat.

There was a very large family of them, about two hundred in all; and with their sharp, hungry jaws they were not long in laying waste that fine bed of green parsley, you may be sure.

As each hungry baby had sixteen tiny legs, they found no trouble in creeping about, here, there, and everywhere.

I am obliged to say, right here, that they were

not very good-natured children either, for when I touched any one of them with a small stick, it would thrust out, from behind its head, a pair of orange-yellow horns.

And what was still worse, these horns gave out such a bad odor that I was glad to get away from it.

After a few days, they seemed to have lost their appetite; and did not care to eat. So they crept away to a clump of bushes near by.

Then I made a discovery. I found that each of these infants, young as it was, knew how to spin. It spun a silken thread, too. But where did it get its silk? I will tell you.

Each little spinner of this sort has, in the middle of its lower lip, a tiny tube. This tube opens into two long, slender bags inside of the spinner's body.

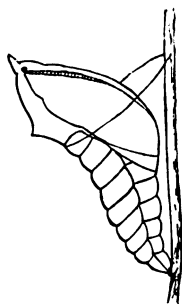
These bags are filled with a sticky fluid that flows through the tube in a very fine stream; but as soon as the air strikes it, it becomes a strong, slender thread.

And so these baby spinners have everything at hand, quite ready for their work. As I could not well observe them all, I watched one of them carefully; and now let me tell you what he did.

First, he spun a small tuft of silk, and made it fast to the twig of a low bush. Then he put the

hooks of his hind feet into this tufted snare. Next he spun a strong, silken loop, made up of many threads, and glued the ends of it fast to the twig; but the ends were not glued very closely together. They were placed a little way apart, so as to make the loop broad and roomy.

It really did look as if this wise little creature was making a swing for itself.



Bound Chrysalis.

But as soon as the loop was made strong enough, he put his head under it, and then worked it over his back. In this way, he bound himself in an upright position, close to the twig.

How strange that of his own choice he had become a helpless prisoner, "bound hand and foot!"

In about twenty-four hours, he cast off his apple-green suit, and became a pupa, or chrysalis. Then the skin of his body seemed to shrivel up, till it was like a strong, hard case; but it made a safe cradle for the baby to lie in.

And just such a cradle was needed; for it was now nearly October, and this tender infant must remain bound to that twig through all the long months of winter.

There would be no lullaby song to soothe it,

excepting such as the cold, wintry winds sing; and that is a very harsh song, as we all know.

"Will it ever come to life?" I asked myself, as I went from time to time and looked at the poor, helpless thing hanging there in its silken fetters, all alone.

But behold! One day in the early part of June, the dry hard pupa case burst open, and out came a poor, feeble, little butterfly, with four limp, moist wings.

Instead of sixteen legs it had but six; and in the place of sharp, hungry jaws it had a slender tongue.

Its great eyes seemed to be almost blinded by the sudden bright light; for, like the moth, it had not only two simple eyes on the top of its head, but it had the two large, compound eyes as well.

It crept slowly up to the top of the twig, and then the weak, drooping wings began to expand. Broader and broader they grew, till at last they were spread out firm and free.

And there, right before my astonished eyes, rose up a beautiful creature, clad in shining black; and I knew by the band of golden spots on all four of its wings that he was a young Lord Asterias!

PHŒBE'S FAMILY.

My first acquaintance with Phœbe began at the garden gate, on the morning that she and her mate called to look for lodgings.

I could see, at a glance, that their hearts were set on having the broad beam that upheld the roof of my balcony; so I made them welcome.

It was a bright spring morning, and I remember just how Phœbe was dressed.

She was clad in a sensible, dull, olive brown; her small crest was a trifle darker than her body, and underneath she was of a yellowish white.

Her eyes were brown, but her feet, as well as her bill, were black. The brown feathers of her wings were edged with a dull white, and so was the outer edge of the feathers of her forked tail.

Her mate was clad in about the same fashion, only that the sides of his neck were darker.

It was a balmy morning in April when they began to build their nest.

The whole front of the balcony was draped with vines, so that when it was clothed with leaves it made a heavy, thick curtain of green; and here the nest was hidden, and secure from harm.

This nest was made of grasses and moss, plas-



Phoebe Birds and Nest.

tered together with mud, and was lined with bits of down, hair, and shreds of wool.

Ah, it took many and many a weary flight to gather the materials for that modest home.

Back and forth, back and forth, the happy couple flew, bearing in their slender bills a scrap of moss

or a mite of down, till at last the whole thing was finished, handsome and complete.

I placed a stepladder conveniently near, where I could stand and look into the nest; for although I had every reason to believe that Phœbe was a painstaking and tidy little housekeeper, yet I rather wanted to see the inside of her home for myself.

So one day, when she and her mate were not there, I peeped in at the nest, and lo, there was a small, cream-white egg, spotted on the larger end with reddish brown! I was very careful not to touch it.

The next day I looked in again, and there was another. And so, day after day, a new egg was added to the number, till there were five of them in all.

Then I noticed that Phœbe began to stay at home a good deal; and if she did chance to go out for a little airing, her mate always took her place.

At length, one morning, I thought I heard a low peep, and seeing that both of the birds were away, I glanced in at the nest.

There I saw four tiny young birds, cuddled down close together. I found that one of the eggs did not hatch, and that it had been thrown out of the nest to the porch.

But what a clamor there was among the young ones when the old birds came back with food! Why, they opened their mouths so wide that it did seem as if their heads would split open. And such dainty food as was brought to them!

There were no wriggling worms, and no stale pieces that some other bird had discarded. No, indeed! for Phœbe's children must have the freshest meat in the market.

In order to secure this, it must be taken on the wing; for the couple belonged to the family of flycatchers, and woe to the unlucky insect that came within reach of their open bills.



Nest of Young Phœbe Birds.

As for the parent birds, they usually bolted their food at one mouthful, but the infants were fed in not quite so hasty a manner.

And so they ate and ate, and grew stronger every day, and when they were a week old, I thought it was time to name them; so I gave each of them a pretty double name.

I called one of them Fluff Wing; another, Feather Down; a third, Brown Breast; and because

the very smallest one of the family looked so much like its mother, I called her Phœbe Junior.

Now, a better behaved family of children one could not desire to see; there was no confusion whatever in the nest, and I never heard an angry peep from one of them.

What was my surprise, then, on seeing them when they were a little more than two weeks old, all sitting in a row on the garden paling, while both the father and mother were perched on a low bough, chirping loudly, in a harsh, scolding tone.

I ran to look into the nest, thinking that perhaps some enemy had driven the family from home; but I saw nothing.

Finally, in about an hour, the young birds left their perch, and flew toward the nest, a few paces at a time; for their wings were weak and their flights were short, and they made several stops before reaching home.

The next day, not hearing any sound from my little neighbors, I peeped in again, and behold, the nest was empty!

On the day following, Phœbe and her mate came back, but the young ones were nowhere to be seen.

They at once began to clean and repair the nest. They threw out bits of thread, down, hair, moss,

and other things that seemed to be in their way; and then added a mite of down here, and a thread of wool there, till the nest was all ready for use again.

Then Phœbe laid four small, cream-white eggs like the others, and in due time her heart was made glad by hearing the faint "peep peep" of four wee baby birds.

Both parents seemed quite as proud of their second brood as of the first, and were never weary of cramming them with the rarest tidbits that they could find.

And when the children were a little more than two weeks old, they were driven from the nest to the garden paling, and were taught to try their wings, in the same way as the other brood.

A day or two later, the whole family disappeared; and what is strangest of all, they went away in the night.

Now, as Phœbe and her mate had occupied their snug quarters all this time, free of charge, I thought it was rather ungrateful of them to steal away in such a manner as that.

But I have since learned that it is the habit of this family of flycatchers, on the approach of autumn, to forsake the nest at night, and travel southward to a milder clime.

Who knows but that their little hearts are so sad, at leaving the home in which they have been so happy, that they can not well endure a final leave-taking in the open sunlight?

I felt very lonely after they were gone, for I never expected to see them again.

But behold! when the genial sunshine and the gentle raindrops of the next spring brought back the swelling leaf buds of the boughs, I heard, one day, a low chirp at the garden gate.

And then two little birds, clad in dull, olive brown, flew in at the old nest on the beam; and I hailed their coming with delight.

One of them was Phœbe's mate, but the other was a shy little creature, of a much smaller size than the Phœbe that I had known, and—let me whisper a little secret in your ear—Phœbe's mate had come back with a second wife!



PHŒBE'S MATE.

THERE'S a little brown bird on that low, leafy
bough —

Do you see? Do you see?
He is calling his mate, for I heard him just now
Say, "Phœbe" and "Phœbe."

I do wonder what secret he holds in his breast —
Some good news it may be
For the shy little mate sitting there on her nest —
His Phœbe — sweet Phœbe.

He is brimful of joy, and he sings all the day;
But it seems strange to me
That this glad merrymaker finds nothing to say
But "Phœbe" — just "Phœbe."

I should think she might weary of such a dull
song,
But not she, oh, not she;
It is music to her through the whole summer
long,
Good Phœbe — fair Phœbe.

By and by they will find some wee birds in that
nest,

He and she — he and she;

And they'll cram them with tidbits, the choicest
and best,

And so proud will he be

That he'll call her name twice where he calls it
once, now;

You will see, you will see,

If you'll watch him some day when he sits on the
bough

With Phœbe — his Phœbe.

TENT BUILDERS.

"THE gypsies are coming! The gypsies are coming!" cried little May, and she hurried into the house, and took her station at the window.

"How do you know?" asked her brother, as he slowly followed her to the window and looked out.

"Because I can see their long, cloth-covered wagons full of little stolen children."

"But how do you know they are *stolen* children?" he said.

"Because I have heard that gypsies do steal children whenever they get a chance; and I hope they will not pitch their tents near our house, for I am afraid of them."

"Why, little sister, we have had tent builders all around our house for months, and I have never heard you say a word about it before."

"Tent builders all around our house!" answered his sister in great surprise. "Where are they, pray?"

"Come, and I will show you," he replied.

By this time the gypsy wagon had passed well out of sight, and so the little girl was not afraid to venture out.

Her brother led the way to a large apple tree that stood in one corner of the garden.

"Look up at those boughs," he said, "and tell me what you see."

"I don't see anything but a lot of worms' nests," she replied.

"Those are not worms' nests," he answered.



Eggs, Larva, and Butterfly of Tent Builders.

"Worms do not build nests like that. Those are silken tents, and they are just as full as they can be of the little workers that put them there."

"Then I want to see them," said she.

The boy took up a long pole having a brush at the end of it; this he dipped into a pail of strong lime water, and thrust it into one of the nests.

Behold! down tumbled a large family of caterpillars, each one of them nearly two inches in length.

The heads of these creatures were black; their bodies were tinged with yellow, marked with finely-crinkled black lines, and there was a whitish line running the whole length of their backs.

On each ring of the body there was a black spot, and in the middle of each spot there was a dot of blue; then, too, every ring of the body sent out thin tufts of soft, short hairs.

"You see these little busybodies wear gay colors," said the boy.

Little May looked at the squirming caterpillars for a few moments, and then said, "How is it that so many of them happen to be living together on one apple tree?"

"I will tell you," he replied.

"One day, a mother moth laid about four hundred eggs around the end of a twig or branch; these

eggs were crowded close together and formed a solid ring. They were very pretty, too, for they looked like little pearls.

"Then, to keep them warm and dry, she covered them with a thick, dry varnish; and no matter how hard the rain came down, her eggs could not get wet.

"As soon as the leaves of the apple tree began to unfold, the wee babies came out of their shells, as hungry as they could be.

"Then they joined together and built a tent. And do you notice that all their tents are built in the forks of the branches? That makes them more secure.



Tent.

"Now when they are not eating, they hide themselves under this weblike tent. Are they not wise little builders?

"They crawl about all over the tree; but, young as they are, they never lose their way, for they spin a silken thread as they go along, and this thread guides them back to the tent.

"As they grow older and larger, they find their tent too small; and then they build it out, so that all can have plenty of room.

"These infants seem to know how to take care of their health, too; for they have only two meals a day, and not even the smallest baby among them thinks of such a thing as eating between meals.

"And what is more, they will not venture out when it rains; they would rather go hungry than get their bodies wet.

"But about the first week in June, this happy family will begin to separate, one from another.

"Then they will wander about in a lonesome sort of a way till they finally reach some sheltered place, and then each one will weave for itself a cocoon.



Cocoon.

"This will be a sort of silken web, and it would be a very frail affair indeed, only that such cocoons are held together by a thin paste; but when this paste becomes dried, it looks like yellow dust.

"They will stay in these cocoons a little more than two weeks, and then they will come out full-grown moths."

"But how can they get out of a cocoon that is woven of silk?" asked the little girl

"Oh, they moisten one end of it so as to make it soft, and then they can easily press through the opening.

"And now would you like to see the mother, herself?" he inquired.

She followed him to his room, and he showed her a small cabinet having a glass door. In this cabinet were two moths, pinned one above the other; but the female moth was much larger than the male.

They were clothed in a color of reddish brown; and each of the fore wings was crossed by two dull, whitish lines that did not run straight across the wings, but were a trifle slanting.

The upper portion of their bodies was tufted with short, soft hairs. Some of these hairs were brown, some were yellow; but the mother moth had a few that were tinged with red.

May looked at the insects very closely; but her brother noticed that she seemed to be disappointed.

"Never mind," said he; "these are only the moths of the tent caterpillar; and now you shall come with me and I will show you some real gypsy moths; and when I tell you all about them, you will agree with me that they are rightly named."

REAL GYPSIES.

LITTLE May's brother had another cabinet in which there was a large collection of insects; and when he opened the door of this one, the little girl again saw two moths.

"One of these moths is a gypsy queen," he said. "Can you tell which one it is?"

"I think it is the one that wears the soiled white dress," replied the child; "for it would be just like a gypsy queen to wear such a dress as that."

Her brother smiled. "You are right," said he.

"It is her mate that wears the coat of brownish yellow, and he is much smaller than she. See how prettily his hind wings are bordered at the margin with brown."

"But they both have dark-brown lines on their fore wings," said the girl, "and the fine fringe of their edges is broken by,—let me count,—yes, there are eight dark-brown spots along the edge of each wing. Isn't it pretty?"

"Very pretty," he said, "but I can plainly see that you are not so well pleased with some of the queen's finery."

"I do not call that *finery*," replied the girl.

"Her dress is of a dirty white; and her antennæ are not so prettily feathered as those of her mate. No, I do not like her at all.

"Besides I can not see why she is any more a *gypsy queen* than the mother moth of the tent caterpillar in the other cabinet."

"You are right," replied her brother. "She is not a queen at all—that is only a title that I have given her. But she is a real gypsy moth, and now I will tell you why she has received this name; and then you will see that she has a right to it.

"Many years ago, a gentleman who was studying the habits of moths brought a few eggs of this kind to our country, from over the sea:

"One day, he laid them on the sill of an open window, and when he turned to look for them they were gone.

"The wind had scattered them far and wide; and this proved to be a great misfortune, as you will presently learn.

"The gypsy moth lays a large number of cream-yellow eggs; and these eggs she covers with soft hairs plucked from her own body.



Gypsy Moth Eggs.

"She takes care to place them on the under side of leaves, twigs, and branches, in such a way that no harm can come to them; and so nearly every egg brings forth a caterpillar.

"Even those eggs that were blown away by the wind soon hatched out; and I now will show you what the caterpillars were like."

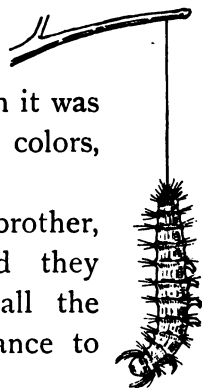
Then little May saw, pinned fast to the back of the cabinet, a somewhat shriveled-up larval baby, nearly two inches in length.

It had a very black head; and its body was of a brownish yellow, having a pale-yellow line running along the middle of the back. On each side of this line was a row of spots, five of which were blue, and the others were of a deep-crimson shade.

There were tufts of hairs all along the sides of the body; and although it was clothed, for the most part, in bright colors, it was an ugly thing to look at.

"These caterpillars," said her brother, "are very hungry creatures; and they travel about everywhere, devouring all the tender, green things that they chance to find.

"When they have stripped a twig or a branch of its leaves, they spin a slender,



Larva of
Gypsy
Moth.

silken thread and let themselves down to the earth ; and then, like the true gypsies that they are, they roam about till they find something to eat elsewhere."

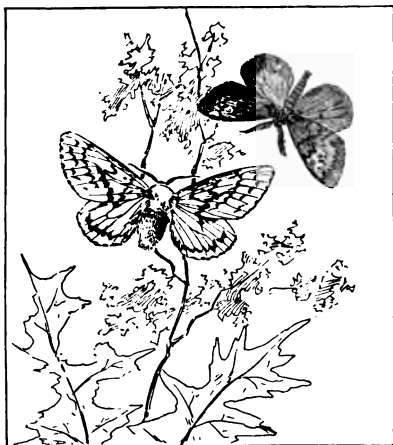
" But how can you be so cruel as to pin them fast ? " asked the child.

" Oh, I never run a pin through the body of any insect while it is alive, little sister ; that would be cruel indeed.

" I put them in a covered box and smother them with something that kills them instantly ; and when I am quite sure that they are dead, I place them here in the cabinet as you see them now ; and in that way I make a good use of them.

" For by this means, I have been able to show you a family of gypsies that are much more to be feared than that small band of sun-browned men and women who have pitched their tents in the edge of the forest yonder.

" It is true, such people as those may now and



Gypsy Moths.

then carry off a few supplies from our gardens ; but they will not destroy every green thing in their way, so as to leave nothing behind them but withered vines and leafless trees, as these gypsy insects do."

Little May was silent for a moment, and then she said, " These gypsy moths are very bad insects indeed ; but after all, they do not *steal* their babies, and our real, grown-up gypsies do."

And with that, she ran away to the attic to watch, at a safe distance, that strange company of restless rovers whose great-great-grandfathers, like those of the gypsy moth, were born in a far-away land beyond the sea.

A LITTLE CAPTIVE.

So, Madam, I've caught you at last ;
 Pray, why did you venture so near ?
 Your four dainty pinions are fast ;
 'Tis useless to struggle, my dear.

Ah, little you've gained, pretty one,
 In breaking your self-woven chain,
 To flaunt your fine robes in the sun
 If you must a captive remain.

To sit in the heart of the flowers,
 To drink of their honey and dew,
 To flit amid rose-scented bowers,
 Gay butterfly, this is-for you.

'Tis yours in the sunbeams to sport
 On bright, jeweled wings all the day;
 And since you're glad life is so short,
 Here's freedom, my lady, — away!



A Captive.

MR. RANA'S¹ DINNER.

A FROG and his mate that had lain rolled up in their mud blankets all winter came up into the sunshine one spring day, and sat down on an old, mossy log.

¹ Ra'na, the family name of the frog.

Just before they leaped out of the water, the female laid a number of dark, round eggs, inclosed in a thin, gluey case.

This egg case of the frog swells out in the water and looks like a mass of jelly. 'It takes about a month for the egg of a frog to hatch out; and the little creature that comes out of it is called a tadpole.

Just as soon as it is hatched, it begins to swim about in search of food, and it is then very active;



The Frog.

but it would quickly die if it were taken out of the water. It has a pair of small, horny jaws with which it feeds upon soft animal food, as well as upon the tender roots and leaves of water plants.

Upon its upper jaw there is a row of very fine teeth; but the lower jaw is toothless.

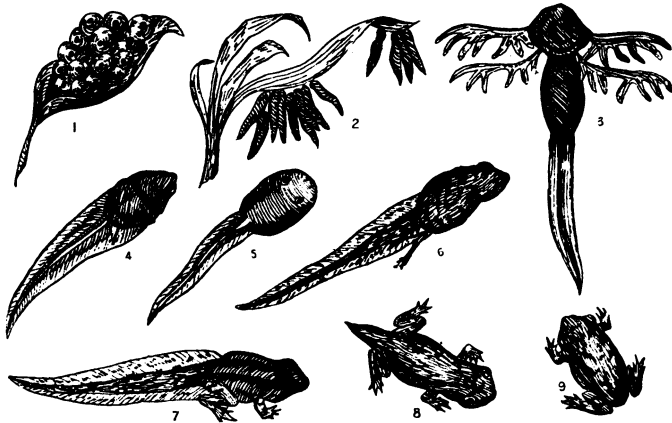
Its wide mouth extends more than half way round its head, and its two nostrils open upon the inside of the head.

Just back of each bulging eye there is a round patch of thin, tight skin that forms the eardrum.

This tadpole, or baby frog, is a queer-looking creature; it has a large head, a long flat tail, and no limbs at all.

But it does not remain in this condition long; for pretty soon it gets a pair of hind legs, and then a pair of fore legs; and as soon as its fore legs appear, it has a tongue. Then it can see, hear, taste, and smell.

Its hind legs grow very fast, and as they get larger and larger, its tail becomes smaller and smaller, till at last it disappears altogether.



Eggs, Tadpoles, and Frogs.

But the tail of a tadpole never drops off, although some very ignorant people declare that it does. If they would collect a few tadpoles and put them into a wide-mouthed jar, they could easily watch their growth, and then they would see for themselves that the tail becomes a part of the young frog's body.

Now, as I have told you before, our baby frog can not live out of the water. How, then, does he breathe? I will tell you.

On each side of his head there is a small tuft that is made up of thin, horny plates. These tufts are called gills; and as the water passes through these small gills, it is separated from the air that is in it, and in this way the little tadpole gets all the air that he needs to support life.

But as soon as he becomes a frog, he can no longer live all the time under the water; for he is then a changed creature, and instead of breathing through gills, he has a pair of lungs.

So when he comes to the surface of the water for air, he gets his first glimpse of the great world around him; and what a strange sight it must be!

But while frogs breathe through lungs, they also breathe through the pores of the skin, which have to be kept moist most of the time; and if a frog is left out of the water too long, he will die.

It takes about five years for these animals to get their full growth, from the time they are hatched from the egg; and as they become too large for their skins, they pull them off over their heads.

Their cousins, the toads, do the same thing with their warty hides; and both toads and frogs have been known to live to be ten or twelve years of age.

But toads, unlike frogs, can live all the time on the land; and they never visit the water except to lay their eggs there.

Now let us see what became of our two friends on the old mossy log.

Ah, well, they had not been sitting on the log very long, when they heard a loud noise that frightened them, and in an instant they were back in the water, and were lost to sight.

After awhile, they came up to the surface, and leaped upon the log as before.

Then the largest one said, in a harsh, croaking tone, "Well, I wonder what will happen next? There seems to be no peace for us anywhere.

"If we had only tried to be contented when we were tadpoles, how much happier we might have been; but young ones never know when they are well off.

"For I remember well that I could hardly wait to see the last bit of my tail disappear,—I was in such a hurry to put on this shining, spotted coat; and now that I have it on, see what trouble it brings me."

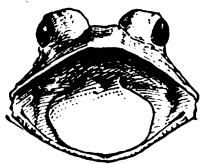
On each side of the frog's neck there was a large sac which filled with air every time that he spoke; and that is why his voice had such a croaking tone.

"What you say is very true," replied his mate;

"but it does seem good to have a tongue in one's head, after all."

There was no harsh, croaking sound in her voice, for a mother frog has no air sacs in the sides of her neck to produce it.

As she spoke, she darted her tongue out very swiftly, and caught a large fly that went buzzing past; and presently her mate did the same thing.



Jaw and Tongue of
a Frog.

Now the tongue of these animals is large, flat, and fleshy, and is tied fast to the jaws in front, so that when it is at rest, it points backward, toward the throat.

But if an insect of any kind ventures too near, out flies this very nimble member, and glues it fast. For on the tongue of both the frog and the toad, there is always a thick fluid that is as sticky as glue.

But the poor frogs did not have a chance to enjoy their banquet very long; for not far away there was a group of boys with a fishing basket and a strongly woven net, and as soon as they spied the frogs, they crept very softly towards them.

"I wonder what a frog would do without its head," said one of the boys.

"Or without its brain," said another.

At this, both frogs held up their heads and listened.

"Did you hear that?" croaked the larger one.

"What would I do without my brain, indeed! Why, it is my brain that sets me to thinking.

"And as for my head, it is fully one third the size of my body, so how could I do without that?"

Then he raised one of his short fore legs and pointed towards his head with his four small fingers; and at the same time, he stretched out his very long hind legs, spreading apart the five webbed toes on each foot as if getting ready for a leap.

But before he was aware of it, both he and his mate were caught in the fine meshes of a net, and were dragged from the log.

As the boys were walking along with their prize, they met their teacher on the way.

"What are you going to do with those frogs?" said he.

"We shall broil their hind legs and have them for our dinner," they replied.

At this, the male frog opened his wide mouth, and gave such a loud croak that the boys dropped their basket on the ground.

"If you will come with me," said the teacher, "I will place a foot of one of your frogs under my microscope; then you can see the fine drops of blood in the thin web that holds its long toes together."

The boys were delighted; and very soon they had the pleasure of seeing this web through a glass that made even the smallest atoms look very large.



Foot of a
Frog.

The little drops of blood followed one another in such a way that one of the boys said, "Why, they look ever so much like the fine grains of red sand that fall from the upper part of an hourglass!"

They were never weary of watching it; but the teacher said that it would be cruel to keep the animals out of the water too long, and that he thought they had earned their liberty, and ought to be carried back to the pond.

So they were placed in a tub of water, and covered up carefully, till after dinner.

But when the cover of the tub was removed, behold, the male frog was the only one to be found!

What could have become of the other? The cover was put on so securely that neither of the animals could leap out. But there sat the larger

frog, all alone, looking a good deal puffed up, and quite stupid, withal.

Now, inasmuch as these animals have no ribs at all, they sometimes look very lank, and at other times very full.

As the boys stood staring at him in amazement, one of them said, "Where is your companion, my fat fellow?" At this question, the frog drew a film over his eyes, and pretended to be asleep.

Now, toads, frogs, and other animals of this class have three eyelids; and this third eyelid that the frog drew over his eyes is a very thin film indeed.

But his pretense of being sound asleep did not aid him in the least; for the teacher said, "Ah, Mr. Rana, I greatly fear that you will never see the slimy waters of your native pond again. For we shall not permit you to get a second mate till we find out what you have done with the first one."

Then he caught him, and smothered him with a piece of soft cotton soaked in ether, so that he died quickly and without pain. And when his stout body was opened, there lay his lifeless mate, stretched out at full length in his stomach.

Now the truth is, that while we were all taking our dinner, this greedy fellow happened to think that it was about time for him to dine also.

And finding nothing nearer at hand, he seized

upon his helpless mate, and gulped her down, without the least scruple whatever; but it is no more than fair to say that had she been the larger and stronger of the two, she would have devoured him, instead of being eaten herself.

Ah, Mr. Rana, you no doubt greatly enjoyed that dinner; but it might possibly have taken away the keen edge of your appetite, had you known that it was to be your last meal!



The Common Toad.

A PLAIN STORY.

I'm a clumsy, awkward toad,
And I hop along the road —
'Tis the only way we toads can well meander;
While in yonder marshy bog,
Leaps my relative, the frog,
Very near my aunt, the water salamander.

And if you should ever stray
 Near a slimy pool, some day,
 And along its grassy margin chance to loiter,
 Do not pass it lightly by,
 For it is the spot where I
 Was born, a lively little tadpole in the water.

And although I take no pride
 In my ugly, warty hide,
 Yet they say within my head there is a jewel;
 But I hope you will not tell,
 For you all know, very well,
 That some boys (whom I could name) are very cruel.

I'm a homely, harmless thing,
 I catch insects on the wing,
 And in this, I serve you all, it is my duty;
 And now tell me, which is best
 To be useless and well dressed,
 Or be useful, even though I have no beauty?

THE MOURNING CLOAK.¹

It was a very sunny day in March, just such a
 day as one might mistake for April.

But April had not come yet; for there were

¹ Van-es'sa An-ti-o'pa, the name of a particular kind of butterfly.

patches of snow here and there upon the hilltops, and the air was not without a touch of frost.

Yet it really did seem so much like spring that many a shy thing peeped out from its hidden nook, as if wondering whether the long, wintry months were really over.



Pussy Willows.

The little pussy cats of the willow sat in double rows along the stem, all ready to throw off their scaly cloaks so as to make a fine display of their soft, mouse-colored fur.

And the squirrels and chipmunks sported about as if they had never seen a hard, crusted snowdrift in all their lives. Far down in the meadow there was a great heap of stones, from which the snow had melted away; and even this rough, hard pile held its share of winter's hidden treasures, as you will presently see.

For in a deep space between two large stones there was the faint flutter of a tiny sash of gold. Was it the gilded border of a fairy queen's mantle?

Ah, but there was another, and still another!

And some of them had the edges badly soiled and torn.

There were so many, in fact, that it looked as if there might be a whole band of fairies shut up in that strong, stone fortress.

And so it proved that a large troupe of fairy beings had been caught in a November snowstorm, and had fled to this stony refuge for safety.

And there they had remained during the long, dreary winter, waiting for the warm breath of spring to float over their hiding place and set them free.

Now can you guess what this fairy circle was? I will tell you. It was nothing more nor less than a family of butterflies that had hidden themselves away during the winter, so as to come out and greet the pale sunbeams of the early spring.

The helpless; almost lifeless little creatures were very closely huddled together as if to keep one another warm; and they had no doubt found it quite a safe stronghold for their winter quarters.

Each one had its wings folded closely together above its back, as if it had settled down for a very long nap.

The wings of this family of butterflies are of a purplish brown above, prettily edged with a broad band of buff; and near this yellow edge there is a row of pale-blue spots.

But the under part of the wings is of a much darker color; it is of a dull blue-black, marked, here and there, with a few faint streaks of a lighter hue.

It is perhaps on account of its somber shade that this insect is sometimes called the mourning cloak.



Mourning Cloak Butterflies.

Not very many butterflies are able to live through the cold weather; but quite a number of this family may often be found in midwinter, sticking fast to the rafters of old buildings, and in the cracks of stone walls.

When found in this way, they appear to be dead; but if they are placed in the warm sunshine, they will soon show signs of life, and become as active as ever.

They are very welcome visitors in early spring, even though their pretty wings are often somewhat faded and torn.

A very close observer¹ of insects and of their habits tells us that this butterfly, if disturbed, will often fold up its legs and appear to be dead. I wonder if it thinks it will escape harm by doing that!

Its larval babies are homely things, and they are hungry things too; they feed on the leaves of the poplar, the elm, and the willow.

And like their parents, they huddle together as closely as possible; so closely, indeed, that it does seem as if they would all feed on the same leaf if they could.

Sometimes they crowd so thickly upon a single



Larvæ of the Mourning
Cloak.

¹ Dr. J. A. Lintner, N. Y. State Entomologist.

branch that they bend it down very low with their weight. So you may be sure that it does not take them a great while to strip a tree of its green leaves.

These black, bristly creatures are marked with very small, white dots; and there is a row of eight brick-red spots along the back.

As they creep along over the trees, they eat and grow, and eat and grow, while all along their track may be found their shriveled, cast-off clothing.

And now, should you chance to come across a family of these ugly larval children, you need have no fear of their black, bristly spines, for they will not harm you.

And if you will gather a few of them, and feed them on the leaves that they like best, they will enter the pupa state after a time; and then, in a little less than two weeks, they will all come forth, each one clad in a mourning cloak.

A GIFTED FAMILY.

Do you know the brown thrasher? He is own cousin to the mocking bird, and is a noted singer.

He wears a coat of cinnamon red, trimmed with brown, and marked at the edges with lines of white. His vest is of a somewhat lighter shade, and is streaked with dark-brown lines.

When he is on the wing, he spreads out his yellowish-red tail feathers like the rays of a fan.

He knows so many tunes, and can sing in so many different voices, that he is often called the brown mocker; and he sometimes gives such fine evening concerts that he has won for himself the title of "nightingale."

But he is not the real nightingale that we read so much about.

He belongs to the thrush family, and is the largest of them all; in fact, he is a brown thrush, if you call him by his real, plain, homespun name, leaving off his titles.



The Brown Thrasher.

You should see him when the cherry trees and the hedgerows are in blossom! His throat is so brimful of melody then, that it runs over; and his gushing strains, so sweet and clear, may be heard a half mile away.

A pair of these birds once made a nest in a thicket of briars very near the ground. It was built of small sticks, filled in with layers of dry

leaves, and was lined with fine, threadlike roots; but there was no mud plaster to make it firm and strong.

These birds build so low that the rough winds can not shake their nests, so they do not need to make them very secure.

Within the nest the mother bird laid five greenish-white eggs, dotted with reddish brown; they were prettily ovate in form, and were nearly an inch in length.

Now it happened, one day, while the owners of this small abode were away from home, that a large, black snake took it upon himself to visit their quarters, in search of fresh eggs.

He had hardly made his way through the tangled briers when the two birds returned, and, finding the intruder's head so near their open door, they flew at him in a great fury.

They beat him with their strong wings, and pecked at his head and eyes with their hard, horny beaks, till he was forced to glide swiftly away through the sharp, thorny briers that pierced and stung him on either side.

Soon afterwards the mother bird took her place upon the nest, and she did not leave it till the eggs were hatched.

Her mate kept her constantly supplied with bee-



Fight between the Brown Thrashers and the Snake.

tles, crickets, and other insects, and I am afraid that he stole a kernel of corn now and then from a newly-planted hill. But the large number of insects that he destroyed more than made amends for the theft.

One day a man, who was strolling in the fields, came upon the nest of small fledgelings, and carried one of them home with him to raise as a pet.

The parent birds pursued him, scolding loudly, but finally returned to the nest to look after the others that were still left to them.

The young thrasher was put into a cage, and he grew to be very tame, and had many cunning ways.

When a crust of bread was thrown into the cage, he would pick it up and carry it to his saucer of water and soak it well before eating it.

Like his parents, he was fond of crickets, beetles, wasps, and all insects having a crusty, hard covering for their bodies.

One day a large wasp was dropped into his food basket. He caught it, at once, and knocked and thrashed it about till its wings were so broken that it could no longer fly.

Then he threw it down on its back, and eyed it very closely to see if it had a sting; and, to make himself very sure on this point, he took up the insect's abdomen in his bill and gave it a tight squeeze, so as to make the poison flow out, before he ventured to swallow it.

Then he gulped it down with a relish, and turned his pretty head from side to side, as if asking for more.

As he did so, there was a proud look in his golden-yellow eye that seemed to say, "Oh, I am a knowing fellow; but it is not to be wondered at, for I belong to a very gifted family."

A VAIN LITTLE MOTH.

I KNOW I must be a lovely creature, else why do people call me the "beautiful wood nymph"?

Look at my pure white fore legs, marked here and there with brown spots.

See the dark, purple-brown band that is set along the edge of them. Is it not pretty?

This band has a narrow heading of olive green, and there is a slender, wavy line of white running through it.

You will see my hind wings are of a rich yellow; and they, too, are edged on the hind border with a deep, purple-brown band.

My finely-shaped yellow body is dotted with small, pearly scales, and striped with narrow bands of black.

I wear tiny white mufflers on my fore legs, but



The Wood Nymph
Moth.

my other legs, all four of them, are black, and so is my head.

My antennæ are very graceful because they are so long and threadlike; they are not feathered like the antennæ of most moths. Is it any wonder that I am called beautiful?

I was as handsome when I was a larval baby as I am now, for I was clad in a pretty blue dress, banded with twelve orange stripes, and each band was dotted with black.

Are you quite sure that you did not see me when I had on that dress? You must have seen me then, although you may not have known my name.

I used to visit your grapevine often and often in those days; for I was very fond of chewing the young, juicy leaves, and sometimes my friends and I would strip the vines bare.

Then we would go to the climbing creeper above your doorway, and take a good nip at the leaves and stalks of that.

We were as pretty a family of larval infants as one would care to look at; our colors were very bright, and our heads, as well as our feet, were of a deep-orange hue.

But we did not always keep together on the same leaves, and if you had looked for us almost any hot day in August, you would have found us

resting, singly, on the under side of a cool, green leaf.

Now it is the habit of some of our family, after they have eaten all they need, to bore into the stem of a plant, or sometimes into a piece of wood, and make it their winter quarters. But I was too wise to do that, for I wanted a still safer place for myself.

So one night, late in September, I crept softly down a slender vine and buried myself in the ground. There I was, a helpless pupa, an underground baby, without so much as a cocoon to cover me. Was I not very brave?

But it was the right thing to do after all, for I slept there safely through all the cold winter, and it was early in June before I awoke from my long nap. Then I came up from the dark earth.

I was very weak and feeble at first, but it was not long before I found myself sailing gaily about in this handsome robe that I am wearing to-day.

And now I will tell you a strange thing about some of my relations. There is quite a large family of them, and they fed on the leaves of a fine creeper that ran over the walls and windows of a city church.

So when they had eaten and eaten till they were satisfied, they crept inside the church and hid them-

selves under the edge of a soft, woolen carpet. What a snug, cozy corner they had found, to be sure!

Then with their sharp jaws they bit off some threads here and there, and soon they had a fine, warm place for their winter quarters.

But it turned out that this was not a safe place for them at all; they might better have gone down into the cold earth as I did.

For in a very short time, the poor, helpless things were discovered, and I have heard that not one of them was left to tell the tale.

THE PATCHED COAT.

"WHAT an odd-looking coat you have on!" said a buzzing June beetle to a larval infant of the common clothes moth.

"Yes, it is made up of a good many colors," replied the other; "but you will not wonder at that when I tell you that I was born in a rag bag."

"Born in a rag bag?" said the beetle, and he went flying and buzzing about the room for nearly five minutes before he spoke again.

Then he came back, and lit on the soft, woolen rug where the plump larval infant was at work.

"What in the world are you doing now?" he inquired.

"I am just setting a small gore into one side of this open case in which I live; for if you look, you can easily see for yourself that it is a case, and not a coat.

"The truth is, I eat so much, and grow so fast, that my narrow quarters will not hold me; so, with my sharp jaws I make a slit here, and another there, and weave in a small patch wherever it may be needed."

"But pray, how did you happen to be born in a rag bag?" asked the beetle.

"Because my mother chanced to lay her eggs there; she found a bag full of soft, warm, woollen scraps, and she knew it would be a good place for her babies.



Larva and Pupæ of Clothes Moth.

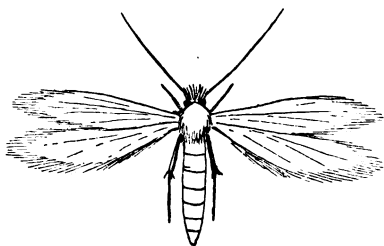
"And it *was* a good place, for as soon as we came out of the shell, we found our food ready for us.

"So we gnawed and gnawed everything within our reach, and covered our bodies with the bits that were left.

"Some of these scraps were red, some were white, and others were blue; that is why my coat, as you call it, has so many colors in it.

"But by and by, I shall get my growth; then I shall close one end of my case, and lie still, with my head toward the open end, through all the long winter.

"And when the spring comes, I shall change to a pupa; then I shall be a real baby moth, and in about three weeks from that time I shall leave my close, narrow quarters, and be a baby no longer."



The Clothes Moth.

"But how will you get out of that hollow case?" inquired the other.

"Oh, I have some small, sharp spines on my body, and I can use them in creeping towards the mouth of the case; then I will crawl clear out of it and leave it forever.

"It will be of no further use to me, for when I come forth I shall flit about on four tiny, buff-colored wings. I shall look very pretty then, for on my forehead there will be a thick, silken tuft of orange yellow.

"At nightfall I will dart about, here and there, into dark closets where I can find some thick, winter dresses hanging up, or some soft, woolen blankets packed away; and maybe I shall get a chance to creep in among some nice warm furs or feathers; and when I find as good a place for my eggs as my mother found for hers, I shall lay hundreds of them."

With that, she bit off some bright, fuzzy threads of the woolen rug, and went on with her mending.

And the June beetle flew round and round, and made a loud whizzing noise, as much as to say, "I do wonder!"

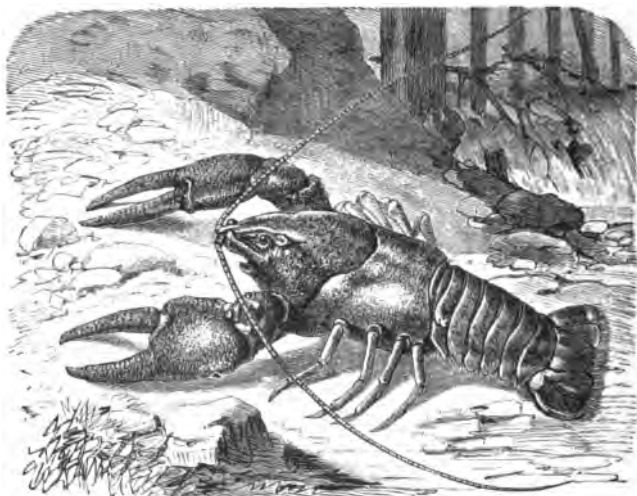
A CRUSTY FELLOW.

I KNOW where a clear crystal stream flows through a deep gorge in the mountains. Sometimes it passes over high rocks, and then dashes down like white sea foam to its stony bed below.

At other places, where the rocks are not so high, it falls in thin sheets, or in shining, silvery threads.

It is a pretty stream, and I often wander along its banks; for I am acquainted with some queer little people that dwell there, and they live right in the water, too.

There is one strange fellow, in particular, that I want to tell you about. But he hides himself in



The Crayfish.

deep holes and under stones during the day; so one must understand this sly trick of his in order to find him at home.

Let me tell you how he looks. His body is long, and somewhat flattened, and he is clad in a stiff, horny coat that is very hard and strong.

But his coat never becomes very ragged ; for he grows so fast that he has to put on a new one every year.

And very often he has a hard time in pulling the old coat off ; for the new, thin garment is already there, fitted closely to his body. Its color is of a light, yellowish brown, at first, but after a time it grows darker.

And now I hope you will believe me, when I tell you that this fellow has no less than five pairs of walking legs and six pairs of swimming legs.

And, what is more, should he chance to lose one of his legs, he would have another in its place, in the course of a year.

But he needs them all, every one of them, as I can plainly prove to you.

His swimming legs are generally called swimming feet, and sometimes they are called "swimmerets." The word "swimmeret" means "a little swimmer."

The swimming feet, when not in use, are almost entirely hidden under his large abdomen, which is made up of many plates that end in a wide fin at the tail.

His mate has small, leaflike plates at the end of her swimming feet, and these are edged with a fine, hairy fringe.

She lays a large number of eggs which she carries about attached to this fringe.

It seems a little odd that this creature should have ten walking legs besides his ten swimmerets; but he is not built like a fish, and he would soon become tired of swimming about all the time.

His first two legs are the largest, and each one of them ends in a long claw that is divided like a pair of nippers.

And what a tight pinch he can give with those nippers! The tiny fishes in the stream know all about it; and they dart away in terror, the moment they get a glimpse of him.

But this is not all, for he has five pairs of jaw feet besides; so he is well armed to seize upon the weaker animals in the water, and he seldom goes without a good dinner.

He likes to make a meal of small fishes, water snails, larval babies, and the like.

He also has two pairs of antennæ, and the outside pair is very long; he can move them up and down, and turn or curve them at his will. This long pair he uses to feel with; and the small antennæ are used to hear with.

But his compound eyes are the queerest of all; for they are set on two pegs, and he can push them out or pull them in, as he pleases.

Now this curious fellow is called the crayfish, or crawfish, though he is really a crab fish; for he is own cousin to the common crabs that are found along the seashore.

Have you ever seen a soft-shelled crab?

When the salt-water crabs first shed their coats they are called "soft-shelled crabs" and are gathered in large numbers for food.

But they do not all shed their coats every year, as has been proved; for a full-grown crab of this sort was once found covered with oyster shells of five years' growth. So it is plain that he must have worn the same coat for five years, at least.

The salt-water crab of this kind has one of the hands much larger and stronger than the other. He uses either or both of them for feeding himself, but with the larger one he digs in the sand.

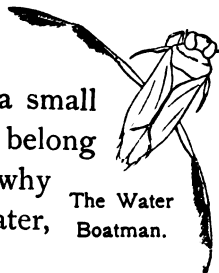
Now within the body of a crab there are found, at certain times of the year, two hard balls, that are of the nature of lime; they are often called "crab's stones," and sometimes, "crab's eyes."

But in some strange manner the substance of these balls is changed, so as to form the hard, outside covering of the animal's body.

And it is just in this way that the small crusty fellow in the mountain streams gets a new coat for himself every year of his life.

WAS IT A SHADOW?

ONE sunny afternoon in summer time, a water boatman and a skater¹ chanced to meet on the surface of a small pond. Now both of these insects belong to the water bug family, and that is why they happened to be traveling by water, instead of going about by land.



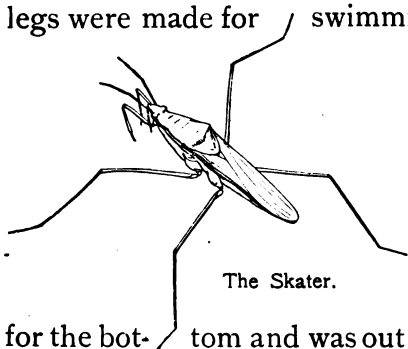
The Water Boatman.

"Halloa, friend Skipjack!" shouted the boatman, "would you like to take a trip with me to the bottom of this pond?"

"Thank you, I am not a swimmer," replied the other, "so I do not care to go to the bottom, so long as I can stay on top."

"Oh, I see," answered the boatman; "my long, hind legs were made for swimming, and your sprawlers, for skating; so it is just as well for each one to stick to his trade."

He had hardly spoken the last word when he made a dive for the bot- tom and was out of sight in an instant.



The Skater.

¹ One of the Hy-drom'e-tra, — a water bug.

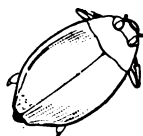
As soon as he was gone, the skater began to move backward and forward with great speed; and as he darted about in the bright sunshine, he looked like a long shadow made up of slender legs!

The under part of his body was covered with a soft, plush coating, so that the water could not touch him at all; and he could skip about everywhere for hours at a time, without so much as wetting his feet.

There were plenty of tiny insects all about him that he could seize and devour at his leisure; so what good reason had he for running the risk of going down to the bottom of the deep?

It was not very long before a whole swarm of whirligigs came dashing by; these insects belong to the water beetle family.

Their bodies are of an oval form, and of a bluish black color; and they are well named "whirligigs"; for they are hardly ever quiet and still for a moment in their lives.

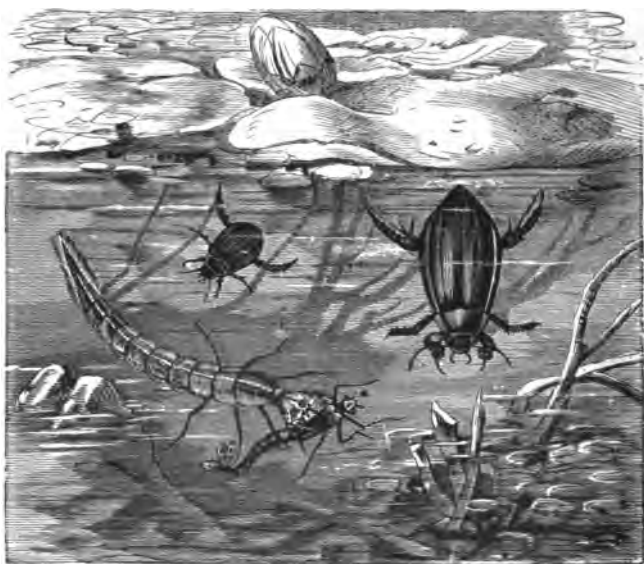


The Whirligig.

So they went gliding and circling about over the surface of the pond, and finally each one of them gathered a bubble of air in the tip of his abdomen, and plunged to the bottom.

"Well, well," said the skater, "so I am left alone again, and I am glad of it."

And he had very good cause for being glad, too; for if he had touched those creatures with so much as a single toe of his foot, they would have thrown out all about them a very disagreeable milky fluid.



The Water Beetle and Larva, and the "Water Tiger."

Pretty soon there was a slight ripple on the water, and in a moment more, up came a large diving beetle to the surface.

His body was also oval in shape, and so flat,

above and below, that he looked like a little boat as he sped along over the waves.

The skater watched him a few moments, and then said, "Pray, Mr. Diver, have you seen anything of my friend, the water boatman, in your travels?"

"Yes," replied the other. "I saw some young water tigers running about after him, only a short time before I came to the top."

"Water tigers?" said the other. "What are they?"

"They are very hungry larval infants, with strong, sharp jaws, and they live at the bottom of the pond, where they can find plenty to eat. And a fine time they have of it, too. I was once a baby tiger myself, so I ought to know all about that kind of life.

"Many and many a time have I snipped off the tails of the little tadpoles, and of the young fishes; and I would not mind even now to get hold of —"

The skater gave a sudden jerk backwards, and when the diver looked around, he was nowhere to be seen.

"Well, that seems a little strange," said he. "Can it be possible that all this time I was talking with a shadow?"

ALMOST A BIRD.

Do you see that large, green worm creeping upon the tomato vines? Its thick, stout body is fully three inches in length.



The Tomato Worm.

It is an ugly thing to look at, but it will not hurt you; that sharp horn upon its tail can not harm you in the least.

See those whitish, slanting stripes along the sides of its body. They make quite a pretty trimming for its green coat, do they not?

Take it home with you, and put it into a panful of earth. Cover it over with tomato leaves or the leaves of the potato; it is quite as fond of one kind as of the other.

But you must look after it once in a while; for as soon as it has eaten enough of the leaves it will bury itself at the bottom of the pan.

There it will build an earthen cocoon and be-

come a pupa; and its pupa case will be of a reddish-brown color.

It will have a long, slender tongue case, bent down from the body so as to touch the breast and shaped somewhat like the handle of a pitcher.

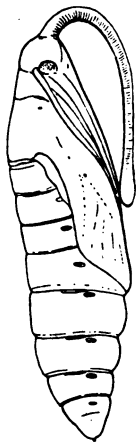
Think of a little creature having so long a tongue that it has to be inclosed in a separate case, even in its babyhood!

When the long winter is over, it will waken from its sleep. Then a poor, weak moth, with feeble, crumpled wings, will make its way up from the soil in the pan.

Push a stick down into the soil, so as to lend it a helping hand. It is the most that you can do for it, and that is quite enough. It will soon creep to the top of the stick, and when its wings become dry and strong, it will need no farther aid from you.

Have you ever seen a humming bird? Well, your little moth will look very much like one. In fact, it is often called a "humming-bird moth."

This insect has a stout body; and on each side of the body are five round, orange-colored spots encircled with black.



Pupa Case of the
Tomato Worm.

Its wings are narrow and pointed, of a gray color, and marked with dark lines; but the fore wings are longer and broader than the hind ones.



The Humming-Bird Moth.

Its tongue is a good deal longer than its body; and when not in use, it is coiled up like the spring of a watch. No wonder that it needed a separate case for itself!

This tongue is for sucking up the sweets of flowers; and as the insect flits around among the pretty blossoms, it makes a low, humming noise.

It chooses the early morning hour, or the evening twilight to go in search of its food; and then, if you watch it very closely, you may see its long tongue, as it darts it quickly into the sweet blossoms of the honeysuckle, the morning-glory, and other flowers having deep, tubelike throats.

"Almost a bird," you will say to yourself, as you watch its movements; and you will wonder more and more that so beautiful a creature could ever have lain hidden away under the ugly larval skin of a "green tomato worm."

"IF."

TABBY, the house cat, lay on a soft rug by the open door, looking wistfully toward the top of a small cherry tree that stood close at hand.

"There is a robin's nest in that tree," said she to herself, "and there are some young birds in it. What a tender morsel one of them would make for my breakfast, if—"

Just then the housemaid chanced to spy the keen eyes of the cat directed toward the tree, and

she gave her a sound box on the ear that sent her flying into the back yard.

But Tabby was not to be cheated out of a good meal by such treatment as this; and she stole softly back toward the foot of the tree and crouched low down in the grass, so that she was almost hidden from sight.

"I will wait," she said, "till one of the old birds flies down from its perch, then I will pounce upon it, and begin my breakfast on that, and if —"



The Robin's Nest.

All at once a large, heavy stone came whizzing through the air and barely missed hitting her on the head.

With a loud "m-e-ow" she bounded away, and hid herself in one corner of the fence.



Tabby.

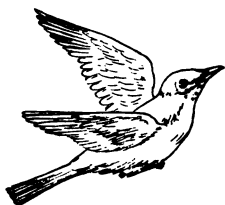
Now this nest on the bough was well built

of mosses, straws, and dried stems, plastered together with mud, and was lined with soft grass.

And when it was all complete the mother bird laid within it four small eggs of a greenish-blue tint.

By and by, the eggs hatched out, and then there was a nest full of little children, and oh, such appetites as they had!

Both Mr. and Mrs. Robin were early risers; for they knew that the fat cutworm and his family were in the habit of coming up out of the ground during the night, in order to feed on the tender stalks of the cabbage, the beet, and other garden plants.



Mr. and Mrs. Robin.

So away they would sail on soft wings, the father bird saluting the sky, as he skimmed the air, with a song of the sweetest melody.

The heads and wings, as well as the tail feathers of these birds were of a dark brown, but their plump, glossy breasts were of a pale, yellowish red.

Everybody that saw them stopped to admire them, and to listen to the sweet notes of their morning hymn.

Pretty soon they would come flying back to their leafy home, bearing in their yellow bills some choice tidbit for the little ones in the nest.

Beetles, grubs, moths, caterpillars, and cutworms, by the hundred, were carried to that young family every day; and yet four tiny hungry bills were always open, calling for more.

So they grew and grew, and pretty soon the little nest was too small to hold all of them together; and one day, as one of them was crowded to the very edge of the nest, he tumbled out and fell to the ground.

Alas, alas! Tabby's watchful eyes beheld the mishap. "Now is my chance," she said, and in a moment she was on the spot.

As she moved her tail from side to side, she looked very fierce indeed, almost as fierce as her wild cousins, the tigers and the lions, that roam the forests in search of their prey.

Suddenly she made a spring to seize the helpless baby bird with her sharp claws.

This was more than the terror-stricken parents could endure, and sweeping down from the bough, they hovered above her form and dealt her several hard blows with their wings.

Then they pecked her body with their sharp bills, and pulled tufts of hair out of her head.

It was hard, very hard, for her to yield up her prize; but the birds fought her so furiously that she was glad to escape; and with a cry of rage

and pain she leaped away, leaving many tufts of her soft fur behind her.

The housemaid, hearing the clamor made by the old birds, came to the door, and saw the helpless infant lying on the ground. She took it up tenderly and replaced it in the nest, where it soon cuddled down as happy and contented as if nothing had happened to it.

When the parent birds found that their darling was unharmed, they flitted about from bough to bough, and chirped their gratitude and delight; but it was a long time before they would leave their little home unguarded.

When one of them went away in search of food, the other would remain on the bough to watch their treasures.

It was not many days, however, before the young birds began to try their wings; and one morning the whole family flew away from their leafy home, and did not come back.

As for the cat, she had learned a useful lesson; for when the parent birds returned the next spring, and took possession of their old quarters, Tabby never so much as cast a glance toward the tree.

"I will not go near them," she m-e-owed to herself; "for if I do"—here she stopped, licked

her paws, and rubbed very tenderly a bare place on the side of her head.

Ah, Tabby, it will take you many a day to comb and smooth your fur, before that bald spot will be covered; and even then, you will never look as sleek and fine as you did before the battle!

WITH AUGER AND SAW.

PART I.

"WHY do you speed along in such haste?" said a stout-bodied sawfly to her cousin, the horntail fly, as they both chanced to be going in the same direction.



The Horntail Fly.

"Pray do not ask me to travel at your sluggish pace," replied the other. "I am on my way to that tall elm yonder; for I want to bore into its trunk, and hide my eggs there, and this bright July morning is just the time for it."

"I am going to that very tree myself," said the sawfly; "but I shall make a slit in one of the leaves for my eggs, which I am sure will be much easier to do than to bore into the hard trunk of a tree."

"That is as you like," answered the other. "I work with an auger, and you with a saw; and it is a good thing that each of us prefers his own tools." And with this short answer she sped on, out of sight.

And now let us watch her, as she busies herself on the trunk of the tree yonder. Her head is large, her body is round and long, and she has long, narrow wings.

At the end of her body she has a sharp needle or auger, with which she can bore through both the bark and the wood of a tree.

It does not take her very long to do her work either, for she has already made several holes, and into each hole she has pushed a small egg.

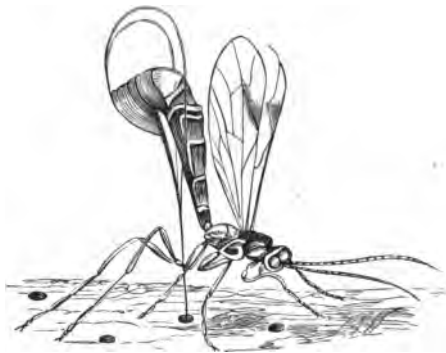
Now, Mrs. Horntail's infants will be ugly, white grubs, with small, round, horny heads, and pointed, horny tails. They will each have six legs, and such sharp jaws that they can gnaw their way anywhere through the tree.



Larva of the Horntail Fly.

They will feed on its sweet sapwood ; and when they have eaten so much that they can eat no more, they will make for themselves, each, a silken cocoon, and into that they will weave some of the small chips that they have chewed. Then they will go to sleep.

And when at last they have finished their nap, they will cast off their pupa skins, break open their cocoons, and crawl up to the very end of their burrows.



The Ichneumon Fly.

Then they will soon gnaw away the bark, and come out with four smoky-brown wings.

And what is strangest of all, insects of this kind have been

known to remain so long in the pupa state that after a tree was cut down and the wood was planed and polished, and made into furniture, they gnawed their way out of it.

But the horntail fly is not the only insect that works with an auger ; and although her sharp borer is a full inch in length, she has a sly enemy that

carries one from three to four inches long.¹ And what do you suppose she does with this long tool? She hunts around for a time till at last she finds the tree in which Mrs. Horntail's larval children are hidden. Then she thrusts in her auger, here and there, and slyly pushes an egg into each hole.

And when her babies hatch out, they creep about through the body of the tree till they find a fat young horntail.

Then they have no farther to look for their dinner. It is all ready for them; and you may be sure that they do not wait to be invited, but seize upon it at once.

They soon make themselves fast to the skin of the helpless infant and feast on him to their hearts' content; and no matter how much he may wriggle and squirm, they do not loosen their hold till the meal is finished.

Ah, Mrs. Horntail, you would not have sailed so proudly away, could you have seen what the end might be!

Possibly your family may live to flit about in the warm sunshine of a pleasant July day; but your enemy has marked the tree, and she is on your track.

¹ The ich-neu'mon fly.

WITH AUGER AND SAW.

PART II.

AH, here comes the other wise little carpenter, bringing two sharp saws along with her. She has taken her own time; but she is here at last. And



The Sawfly.

what a pretty little busy-body she is!

Look at her closely, and you will see that both her head and her thorax are of a glossy

black; but the other parts of her body are of a steel blue, spotted with yellow.

Her four thin wings are of a smoky brown; her legs are stout, and of a blue-black color, and her feet are of a pale yellow.

Does she not resemble a hornet? Well, she belongs to the same great family¹ as the hornet; so it is no wonder that we can trace a family likeness.

But the hornet has, at the end of her body, a very sharp sting; while the sawfly carries a pair of keen-edged saws instead.

See, she is using them now to make a slit in

¹ Hy-men-op'te-ra, membrane wing, or thin wing.

that leaf; and when it is done, she will drop an egg into it.

And because she has made a hole in the leaf, the sap will not flow smoothly along as it did before, but it will gather there. And after a time there will be a hard lump, like a knob, in that place; and wherever she places an egg, there will be just such a swelling or knob.

Inside of each lump there will be a squirming, larval baby, clad in pale, greenish yellow, with a black stripe running all along its back.

And what active little creatures they will be! Each one of them will have no less than twenty-two strong legs, so it will not take them long to strip the leaves from that tree.



Sawfly Larvæ.

And what is more, should you chance to touch one of them ever so lightly, he will spirt from the sides of his body a jet of fluid right into your face.

Now when these hungry creatures have feasted for a long time, they will crawl down from the tree and bury themselves under the dry, fallen leaves.

And there, in a thick brown cocoon, each small

infant will stay, snug and safe till spring. Then it will break open its pupa case and push hard against one end of its cocoon, till it opens like a little lid, and out it will come, a four-winged sawfly, having a body nearly an inch in length.

The body of the male is longer and narrower than that of the female; and there is no saw at the end of it. The males of bees, hornets, ants, horn-tails, and all other insects of this kind have neither sting nor borer at the end of the body.

But both males and females have two pairs of jaws,—one for biting and cutting the leaves and twigs of plants, and the other for sucking the sweet juices.

There are many curious insects that belong to this large family, and among them is one that is named the gallfly. It is a very small insect, having a body not over a quarter of an inch in length.

Have you ever seen a little brown ball fastened to a twig, or to the leaf of a plant? I hope you did not try to bite it, thinking it was a nut. Let me tell you how these little balls happen to be found in such places.

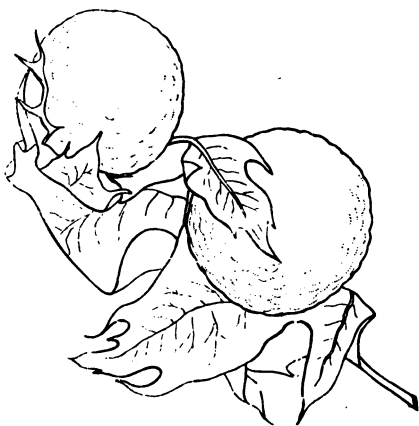
A mother gallfly lays her eggs in a leaf or stem, something after the manner of the sawfly, and these nutgalls are the homes of her larval infants.

As soon as these larvæ are hatched from the

egg, they begin to feed on the soft pulp within the ball; and as they increase in size they cast their skins till they reach the pupa state.

Finally they escape from this pupa case and gnaw a little hole through the shell of the nut; then they come forth with wings into the great world outside.

And now that you know how these little brown nuts are formed, I am quite sure that you will examine them very carefully should you chance to come upon them in your walks.



Gallnut on Oak Leaves.

If you will look at some of them closely, you will find the open door through which the winged insect came.

So you see, these little mothers that we find flying about everywhere are really very wise, and they are worth our careful study.

The fields and forests are alive with them, for they are ever on the wing, and we have only to keep our eyes open in order to learn all their secrets.

FOUR PINK BABIES.

THERE was a great stir in the cottage of Dame Dutton; for it was the first day of April, and the good dame never allowed that day to pass (unless it chanced to fall on Sunday) without a general upheaving and overturning of everything that was movable under her roof.

"I will begin at the pantry first," said Mistress Dutton; "for if my sense of smell does not deceive me, there is a mouse hidden away in that cake cupboard."

So, with sleeves rolled to the elbow, and with her longest bib apron tied snugly about her, she proceeded to attack the cake cupboard, without farther delay.

"Bless me!" cried the dame, as the first whisk of her broom brought down a large, black spider, and with it the fine gossamer web that had been woven with so much care.

"Bless me! who would have believed it, and I so particular about cobwebs, too."

But after the cobwebs (together with all the victims that had been snared by them) were lying in loose tufts on the pantry floor, Mrs. Dutton felt that she had a still greater work to do.

For now there was no possibility of a mistake; she certainly did sniff the strong odor of a mouse, and she felt quite sure that the little thief was not far off.

Nor was she mistaken; for while she stood there, prying and peeping into this corner and that, up jumped a mouse, almost into her very face, and scampered away to an opposite corner of the room.



"Up jumped a Mouse."

Mrs. Dutton gave a little scream, and for a moment it was hard to tell which was the more frightened, she or the mouse.

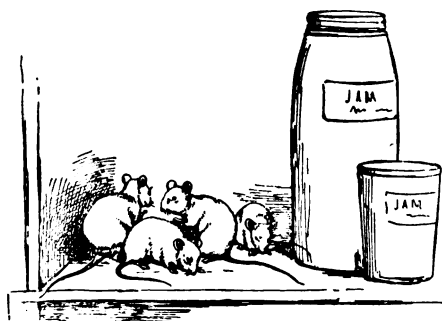
Then she gained courage to make a search along the wooden cleat of the pantry shelf and — could she believe her own eyes — there, in a snug, cozy corner, were four, wee baby mice.

Poor little things! they were so young that they had, as yet, no furry coat like their mother's; and the color of their naked bodies was almost as pink as the gay ribbon on Dame Dutton's Sunday cap.

And their eyes, — well, they had no eyes, so far as she could make out.

There were two mites of eyelids that looked like little warts, but the whole family seemed to be as blind as a nest of young kittens; and everybody knows that young kittens do not get their eyes fairly open till they are nine days old, at least.

What funny-looking little creatures they were!



The Four Wee Baby Mice.

They were both sightless and hairless — ugh!

But these ugly-looking babies were very precious in the sight of the mother mouse, as you will presently learn; and you

must not suppose that she ran away like a coward to return to them no more.

Ah, no indeed, she could not do that; she simply hid herself away for a moment, as if planning what it was best to do next. It was most pitiful to see her trembling there in the corner.

There was a quiver in her pretty, silky ears, in the short, stiff hairs about her pointed snout, and even her long, smooth tail shook with terror.

Oh, how her poor heart did flutter lest some harm should come to the helpless infants that she loved so well.

She had felt *so* secure in that dark cake cupboard, and she had worked so very hard to get inside.

Why, she had gnawed and gnawed for more than a week, before she had been able to make a hole large enough for her own little body to pass in and out.

Now that small opening was her own private door—the little door of her bedroom; and it was so very small that she had never dreamed that any eye but hers could find it.

She had used her front teeth for a chisel, in cutting the doorway, and very sharp teeth they were too, I assure you.

There were four of them in all—two on the upper, and two on the under jaw; and the more she used them, the stronger and sharper they grew.

Many and many a night when she had been gnawing at the doorway, she had heard the footsteps of Dame Dutton approaching the pantry.

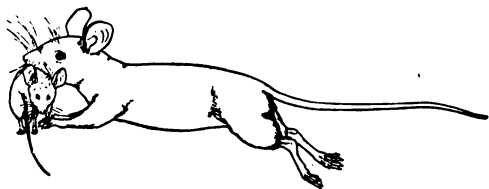
Then she had sped away in terror, not daring to return to her work till almost morning. Poor soul! Do you not feel sorry for her? I do.

I think Dame Dutton must have felt a little sorry, too; for she just stood stock still and looked at her.

After awhile the timid, trembling creature seemed to gain a little courage; and so, very cautiously she crept towards the nest, — that little home that held her treasures.

Then she stopped, and fixed her bright little eyes on the tall giant standing so very near her.

But suddenly she made a dash toward the nest, and seizing one of the babies by the nape of the neck, just as a cat catches up her kittens, she held



The Mother and her Baby Mouse.

it firmly between her teeth, and scampered away with it as fast as her legs could carry her.

Could you have looked closely at her soft, tiny feet, you would not wonder that she sped away so nimbly.

She had four finger toes, and a bit of a thumb besides, on each of her fore feet; while each of her hind feet had five toes; and each toe was armed with a sharp nail.

Ah, such feet as hers were not made to stumble; they were almost as swift as wings!

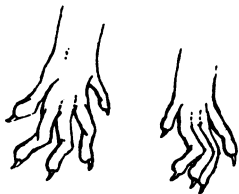
She was gone but a moment, and then her pointed snout appeared at the open door again.

In a twinkling she sprang to the shelf, and rush-

ing to the nest, the second baby mouse was rescued in the same manner as the first.

A third time she came back, and growing a little bolder each time, she made directly for the nest, and disappeared, in a flash, with the third infant.

"Now I will test your bravery, Mrs. Mouse," said Dame Dutton; so she slipped a stiff piece of cardboard under the nest, and held it tightly in her hand.



The mother mouse returned, flitted a few paces forward, saw that the nest had been removed, and then stopped quite still, but shaking and panting with fright.



"Help, help!" peeped the small pink baby, in plain mouse language; and this was more than the mother love could bear.

Feet of the Mouse.

The poor frightened heart beat so loud and so fast that it shook her whole body.

Very slowly she crept along the shelf, and finally she flattened herself out in a sort of humble way, as if begging the huge giant to spare her little one.

Then with one bold effort, she gathered herself

up, gave a quick jump, caught her peeping treasure from the nest, and was out of sight in an instant.

"Well," said Mistress Dutton, as soon as she had recovered from her astonishment, — "well I never! And I always so particular about mice, too."

THE SLUG FLY AND THE GRASSHOPPER.

A MOTHER slug fly that had been darting about in the sunshine all day, finally settled down among the green leaves of a pear tree.



The Slug Fly.

Like the horntail fly, she was armed with a sharp-pointed auger; and with this auger she cut several slits in the under part of the leaf.

These slits were in the form of a half circle, and in each one of them she placed an egg. After that, she flew away and gave no further heed to it.

She was a very small insect, so small, indeed, that her body was not more than a quarter of an inch in length.

But she was really quite pretty; for she was of a glossy-black color, and her four thin wings were

very clear, and were veined with brown; while across the middle of the first pair there was a wide band of a somewhat smoky hue.

It was a warm day in June; and as she darted about in the sunlight, her wings looked as if they had caught some of the bright tints of the rainbow.

"What a beautiful creature you are!" said a large green grasshopper. "I think I must get a little nearer to you, where I can see you better."



The Grasshopper.

And she gave such a long leap that she went clear over the head of the slug fly and landed on the other side of her.

"Bless me!" said the fly; "what very long legs you have, my friend."

"Yes, my hind legs are very long; they are made for leaping about, as you can plainly see."

"And what very, *very* long antennæ," said the other. "They must be nearly twice as long as your body, I am sure."

At this the grasshopper turned her antennæ back, till they extended way beyond her long hind legs.

"Wonderful!" said the slug fly. "What a pity that you have not wings like me."

"Wings?" said the other; "you had better use your eyes."

And with that she displayed two long, straight wing covers, and two thin hind wings that were hidden under them.

"Who would have thought it?" said the slug fly. "But tell me, my friend, what were you digging into the ground for, just before you came here?"

"I was hiding my eggs there," replied the other. "You did not see my wings, and you may not have seen the sword at the end of my body; but I always carry one with me wherever I go."

"It was with this sharp sword that I made a hole in the earth, and put my eggs into it. Then I smeared them all over with a thick glue; for as soon as the glue hardens, it will form a strong case for them."

"And now I have covered up the hole in the ground carefully, and have left them there; for I know they will be safe and warm through all the long winter."

"Now what will your babies be like?" inquired the other.

"They will be like me, only their wings, at first, will look like little scales. But they will feed on all the green things that come in their way till they

have shed their skins six times ; then their wings will be as large as mine."

"What a fine time they will have eating those skins!" said the slug fly.

"Eating their skins?" replied the grasshopper. "Whoever heard of such a thing! My family never eat their skins. Why should they do such a thing as that, with plenty of green leaves all about them?"

Now the grasshopper belongs to the same great family¹ as the cricket, the locust, the katydid, and other insects having straight wing covers ; the mother straight wing lays the eggs, and the father straight wing makes all the music.

And this class of insects do not have a wormlike form, even when they are first hatched from the egg.

"Well," said the slug fly, "my family *do* eat their skins, and they are very fond of them, too. They shed their coat five times before they are full-grown ; and they always feast on every one of their cast-off skins excepting the last."

"What must the children of your kind be like?" said the grasshopper, and as she spoke, she let fall a dark-brown fluid from her jaws.

"Oh, they are beautiful creatures," replied the other.

¹ Or-thop'te-ra, — straight wing.

"They are covered, at first, with a soft, sticky slime, of a pretty olive shade; but when they get



Larva of the Slug Fly.

their fifth coat, it is very dry and of a yellow tint, and as there is no slime

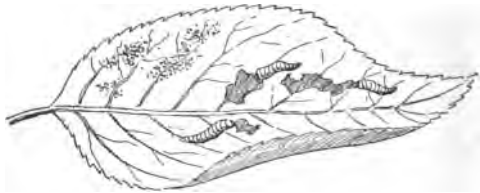
upon that, they do not care to eat it.

"And such nimble little creatures you never saw; for although they are not quite half an inch in length, they have no less than twenty short legs apiece.

"So they creep about upon the green leaves of the pear and of the cherry tree, and with their sharp jaws they cut out all the soft parts of the leaf. But they are so dainty that they will touch neither the veins nor the skin of a leaf, no matter how tender it may be."

"Dainty!" said the grasshopper. "A creature that will eat its own skin — ough!"

The slug fly paid no heed to this remark, but went on: "The



Pear Leaf with the Slug Fly Eggs and Larvæ.

larval babies of my kind are called slugs; and they are very shy little creatures, with small brown heads.

Should you ever meet them, you will know them by this: They have a way of swelling out the fore part of the body, so as to hide their modest heads completely.

"But you will have to look for them pretty soon; for my eggs will hatch out before long. And after the babies have eaten all they need, they will leave the pear tree and creep down into the ground.

"There each one will make for itself an earthen cocoon; and when it awakens from its long winter's sleep, it will come up into the air and sunshine.

"Then it will have four handsome wings like mine; and it will be even more beautiful than when it was a slimy larval infant."

"More beautiful! I should hope so," said the grasshopper; and she let fall a whole mouthful of brown fluid, and gave a leap that sent her clear out of sight.

THE TRUTH OF IT.

"A silly young cricket, accustomed to sing
Through the long, sunny months of gay summer and spring,
Began to complain when he found that at home
His cupboard was empty and winter had come."

WE have all heard the sorrowful tale; how the poor, starved cricket went to a very stingy old ant, and begged for food and shelter; and how the

ant met him with harsh words, and finally turned him out of doors.

It is a very interesting story, indeed; but I am afraid that it is not true, for it does not agree with the history of the cricket family.

The fact is that most all crickets die on the approach of winter. There are only a very few among them that live till spring; and these either hide themselves under stones, or else they creep into some hole in the ground that is warm and dry.

It is true that some of them do sing through the long sunny months of summer, and even until quite late in the fall.

But it is the father cricket that makes the music; and he delights in it.

He rubs the inner edges of his outside wings together with great glee; and he will keep up his shrill music for hours and hours at a time.

It is a way that he has of talking to his wife; and she never seems to grow weary of it. But she takes no part in his tune; for her wings are not formed like his, to make music.

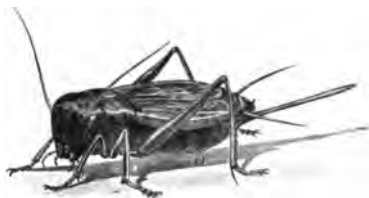
Many of these insects are clothed in black; and it does seem a little strange that so cheerful a chirper as the father cricket should be clad in mourning array.

But he had no choice in the matter; so he may as well be merry and make the best of it.

The mother cricket has at the end of her small body a fine-pointed piercer, as sharp as a needle; and late in the autumn she makes holes in the ground and places her eggs in them.

Sometimes there are as many as three hundred eggs in one mass; but she takes no farther care of them, for she knows that she has left them in a safe place to hatch out.

There is another kind of cricket that is clad in ivory white, with a few yellow tints about the body.



The Cricket.

This cricket makes music, too, and it is often of a very harsh and noisy kind.

But his wife does not always dress in pure white; for sometimes she wears white on a part of her body, while the other portions are tinged with green or with yellow.

She pierces holes in the twigs and stems of plants and pushes her eggs into them, even to the very pith. Then, like the ground cricket, her work is done; for very soon after these insects have laid their eggs, both the males and females die.

It is true that there will be a large family of baby crickets in the spring; but such babies are, in no way, helpless. They all know just what to do.

They will not be wormlike larval babies, either; they will look just like their parents, only that the wings of young crickets are at first nothing but tiny scales.



Young Crickets feeding on Squash.

As soon as they come out of the shell they will begin to eat. They will feast on the juicy roots of the melon, the squash, the potato, grass, and other green things that come in their way.

As these insects become larger and larger, they cast off their baby clothes till they get their seventh suit.

Then they are full-grown crickets, with a pair of long, slender antennæ and four straight wings. But

the two outside wings are not used for flying; they are used as covers both for the under wings and for the sides of the body.

There are some kinds of crickets that, if they chance to get into a room where they find a woolen carpet or a woolen garment of any kind, will soon destroy it.

They have even been known to gnaw holes in boots and in shoes that were made of thick, heavy leather.

A gentleman who was very fond of the cricket's clear, sharp notes, opened his window, one evening, so that he might go to sleep with the sound of their music in his ears.

But when he awoke in the morning, he found that quite a number of them had entered his room during the night, and had eaten several large holes in a new suit of clothes that was hanging upon the back of a chair near the window.

The shrill creak of the cricket late in the autumn does sometimes sound a little sad; but there is no good reason for supposing that it is a song of complaint.

He generally finds enough to eat as long as he needs it; and crickets are not above devouring other insects, in case they fall short of the green, juicy stems and leaves of plants.

So I think you will agree with me that if a bold, hungry cricket should chance to call at the door of a well-to-do ant, she had much better divide her store with him, than to run the risk of being eaten herself.

“RAIN FROGS.”

WILLIE and James were on their way to school. It had rained very hard during the night, and there were little pools of water standing all along the roadside.

Suddenly James called out, “Oh, brother, come here, and look at these queer little frogs that have just rained down. Some of them have quite long tails, and others have no tails at all. I wonder if there are any more like them in the clouds,” and he looked upward toward the sky.

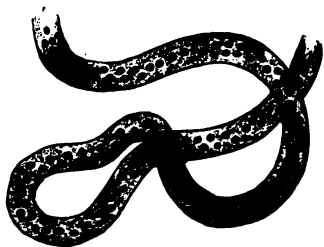
“Let’s take a few of them to school,” said Willie.

So they gathered quite a number of the little animals and put them into one of their dinner pails, which they had emptied for that purpose.

When the teacher saw what the boys had brought to school, she was greatly pleased, and promised them a little talk upon the subject; and this is what they learned that day about “rain frogs,” as they are often called:

Some of these animals were young toads that had been hatched from eggs that the mother toad had laid in a small stream of water not far away.

Toads never go near the water except to lay their eggs, and these are deposited in long chains. From each egg, a very small, jet-black tadpole is hatched; for toads have to pass through the tadpole stage the same as their cousins, the frogs, and when they finally leave the water, their skin is so very ten-



Toad's Eggs.

der that they can not endure the heat of the sun.

So they go down into the moist earth, and remain there during the hottest part of the day; but if they hear heavy raindrops falling upon the ground, they come up at once to enjoy the cooling shower; and that is why Willie and James found so many of them along the roadside that morning.

As they grow larger, they shed their warty skins, and a very queer figure they cut, too, as they pull their loose brown coats off, over their heads. Just before this coat is cast off, it becomes quite dry, and its color looks faded and dull.

Presently it begins to split down the back, and

soon after that, small rents appear upon the under side of it.

At about this stage, the poor toad looks ragged enough; but he pays no heed to that, for he well knows that he has a fine, new garment hidden away, underneath. So he proceeds to get rid of the old one as soon as possible.



The Common Toad.

He twists and turns his body, and uses first a hind leg, and then a fore leg, till at last he is entirely free from his old worn-out suit; but he seems to be very tired after the struggle that he has made.

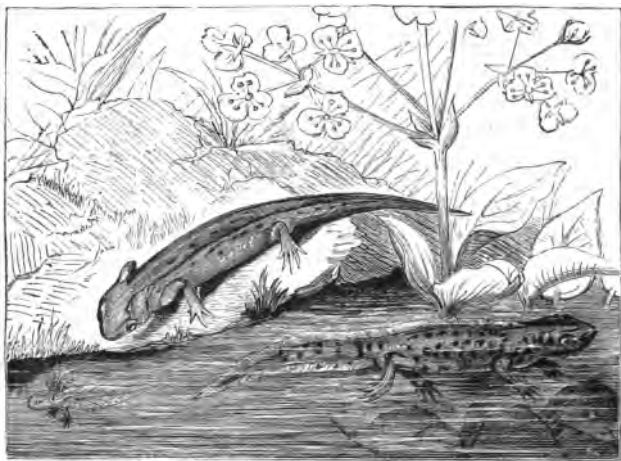
And what is queerest of all, he rolls the old garment up into a small bundle and swallows it, without so much as a drink of water to rinse it down.

He does not even chew the hard, dry morsel, for he has not a tooth in either jaw.

Toads can dart out their tongues very quickly to catch an insect on the wing; and they are quite as fond of small worms and caterpillars as of the winged dainties that come in their way.

One day a toad chanced to see a large number of small insects flying about a panful of sour dough that had been set out near the chicken coop.

So he hopped along till he came to the pan, and then he hopped into that, and rolled himself over and over in the wet dough.



The Newt (Male and Young in the Water, Female on the Bank).

When he was well covered with it he jumped out, and sat very still for awhile; it was not long before the insects began to swarm about him, and behold! his plan was a success; for all he had to do was to dart out his tongue and gulp them down as fast as they came along.

But what about the other little "rain frogs" that the boys had collected that morning?

Behold! they were not frogs at all; they were small red newts, or efts; and they are sometimes called "land salamanders."

These creatures have a body about two inches in length, and the tail is nearly as long as the body.

They are very shy, harmless little things, and they live near the water in cool, damp places. So when the ground becomes hot and dry they bury themselves in the same manner as the toads; but after a shower they come to the surface in large numbers.

In winter they coil themselves up in the earth, and remain there till spring returns.

They are playful creatures, and will run, and chase one another about, as lively as kittens.

Some of them are of a dull, red color, and others are of a bright, orange red, sprinkled with black dots.

They feed on insects, worms, and snails, and are far more helpful than harmful in the world.

Most of them are born in the water, and when first hatched they have the tadpole form.

They are cousins to the water salamanders, so often seen in creeks and small ponds.

But the water salamanders have the back of a deep-olive shade, and the under parts of a rich, orange yellow studded with black dots; while along the sides are small shining spots of flame. Some of them are very beautiful.

These harmless creatures are often found in small streams in Ireland; and many of the peasants believe that if you venture to look down too closely into the water at them, they will leap into your throat and raise a large family of young ones in your stomach.



The Water Salamander.

And they claim that the only remedy for this evil is to find a stream of water running directly toward the south, and to lean over it with the mouth wide open, till the animal jumps out into the stream.

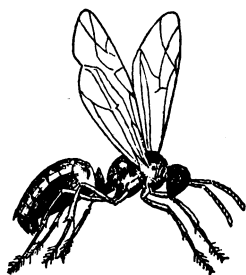
Now we shall not believe such foolish stories as these; neither shall we believe that frogs, newts, or any other living creatures "rain down" from the sky.

For if we use our eyes and study the habits of these shy neighbors of ours, we shall find that each particular kind has its own work to do, and that every living thing about us was created to act its part in the world.

MOVING DAY.

PART I.

"DEAR me!" said a very old worker ant, as she bit off a piece of soft earth, and rolled and smoothed it with her feet. "Dear me! my teeth are nearly worn out now, and this roadway is not half done yet."



Drone.

"Just look at me!" said a nimble young ant, as she stood up on her hind feet and bit off a mite of hard sand above her head.

"And just look at me!" said a large drone, as he spread four thin wings, and flew out at the open door of the ant-hill.

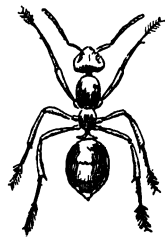
"Yes, you have a fine time of it, Mr. Drone," said the old ant; "but any of us could do that, if we had wings."

As she said this, a long line of little ants ran across the roadway, and each one held in her jaws a small, white roll.

Little girl, little boy, you and I have often seen small ants running about in this way, but we did not dream that these tiny white rolls were wee larval babies, did we?

Neither did we know that the nimble little ants that were carrying them about were the nurses of the family. And what faithful little nurses they are!

When the weather is fine, they carry the infants up into the sunlight; but if the sky grows dark, or if a few drops of rain fall, they seize them at once, and take them down into the little bedrooms below.



Worker.

They pet them, too, and lick them with their little rough tongues, and feed them, from their own mouths, with food which they make ready for them.

Now the queen and the drones are the only ants that have wings; and that is why the old ant said to the drone, "We could any of us do that, if we had wings."



Queen.

The upper two wings are hooked fast to the lower pair; they are much larger than the lower two, and completely

hide them when the insect is at rest.

But the queen has no use for her wings after she goes down into the earth; so she unhooks them from her body, and lays them aside; and sometimes the worker ants take them off for her.

Then she goes about laying eggs; and as fast as she drops them, the workers follow her and take care of them. These mites of eggs are of a yellowish white, and are somewhat oval in form.

It takes but a month for the eggs of some kinds of ants to hatch out; but there are other kinds that require a much longer period. For sometimes the eggs are laid in the fall, and they do not hatch out until the next spring; and even after the insect enters the pupa state, it often remains inclosed in its pupa case for six or seven weeks.

Now there were a good many larval babies in this ant-hill. The eggs were laid late in the fall before; and now that spring had come, and they were all hatched out, it made a large family for one house.

So it happened, one day, that the same wise old ant who had spoken first, said: "There are too many of us here."

"What is to be done about it?" asked another.

"We must look for new quarters," said

Ant's Leg. she.

As she spoke, she drew one of her fore feet through her jaws, two or three times.

Now old as she was, she was a very neat creature, in all her habits. She carried a small hairy brush



on each fore leg, and as soon as she found a mite of dirt upon her body, she brushed it off; and when she wanted to clean the brush, she drew it through her mouth in the way that I have told you.

That was a good example to set for the others, too; for some of the younger ants, who were watching her, began to brush themselves, without delay.



The Ants' Moving Day.

Now it was not many days after this, that a long line of ants marched out of the door at the top of the hill, and went away to live in a new nest.

Busy workers went down under the ground to make new rooms and roadways; a double line of nurses hurried along after them. Some of these nurses carried in their jaws a small, white, legless larval infant, while others carried the pupa cases; and it was not long before there was plenty of room in the old nest that they had left behind.

Many new lines were formed as they went to and fro, and each active little ant seemed to have its own particular work to do.

In fact, they did just as all people do who are

moving; some of them carried a load of valuables to the new home, while others returned, empty-handed for more.

MOVING DAY.

PART II.

"WE have left our good little cows behind us," said the wise old ant. "Who will go after them?"



A Plant Louse.

Just at that moment there came a large number of workers running with all speed towards the new home, each with a tiny green insect in its jaws. These green insects are the ants' cows.

The ants had built their new quarters near the roots of a tree; there the fine, tender rootlets ran down into their nests; and here the workers stopped, and let fall their light burdens.

Now these "good little cows" were nothing more nor less than a family of small green plant lice.

These insects belong to the bug family;¹ and although they are such tiny things themselves, they have some relations that are of large size, and that make quite a noise in the world.

¹ He-mip'te-ra: this word means half wing; the upper wings of these insects are thick at the base.

Some of them do a great deal of harm, too, as you will learn when you read the story about the squash bug.

At a certain time of the year there are some plant lice that have wings; but these tiny "green cows" have none.

Their bodies are small; but they have very long antennæ, long, slender legs, and a beak that is three-jointed.

With this strong, horny beak they are able to suck the juice from every part of a plant, even from the topmost leaf, to the very roots. And sometimes they will cling to a twig or a root with their beaks, and throw up their legs, as if they were having a real frolic among themselves; and if they are touched or disturbed in any way, they will resent it with a speedy kick.

Now the juice that they suck from the plants soon turns to honey within their small bodies; but they do not store it up, as the honeybees do.

At the end of their bodies they have two little tubes, and from these tubes this sweet honeylike fluid is continually dropping.

Ants are very fond of this sweet fluid, and when it does not fall fast enough to please them, they will pat the lice with their antennæ and coax them to give out more. This is their way of milking the cows.

They take very good care of their cows too; they stroke them, and keep them clean, and will not allow any harm to befall them.

They carry them down into their nests, and place them near the sweet, juicy roots of the plants, where they will be sure to have plenty to eat. In fact, they look upon these plant lice as their own property.

Is it any wonder, then, that the old ant was uneasy because they were left behind?

We often read in books of travel about different kinds of ants that do very wonderful things.

Some of them wage war on their neighbors and make prisoners of them; they will even carry off the larval babies of their weaker neighbors and bring them up as slaves.

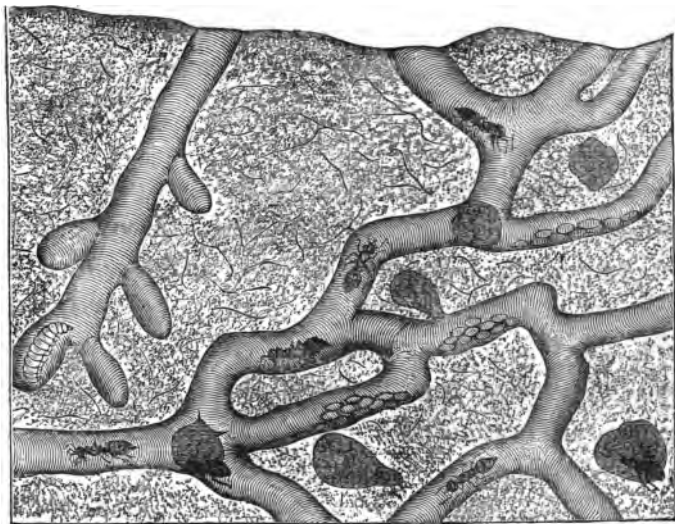
And there is another kind that builds large mounds, and makes smooth pavements around them. And there are still others, so very wise that they know how to plant seeds and to harvest their crops.

In Africa there is a kind called the driver ants, and they are well named; for they march in great armies, and drive everything before them.

But we need not go to foreign countries in order to study the knowing ways of these little insects; for we may find them here, all about us. We

may look for them in trees, in decayed stumps, and under stones; while we can see their small hillocks thrown up all along the wayside.

A gentleman who wanted to see these insects at work in their underground homes, once visited



An Ant Nest, with Underground Passages.

an ant-hill, and carried with him a large pane of glass.

He pressed a sharp edge of the pane down through the center of the hill; and then, with a spade, he scraped away one half of the hill and went away and left it for a short time.

The ants seemed to be greatly distressed at first; but after awhile they all gathered into that part of the nest that was left unharmed.

Then the gentleman went close to the hill, and looked through the glass.

There he saw roadways, halls, and rooms, both large and small; and through these, there were hundreds of busy worker ants, running about in all directions, each one performing its own task in its own way.

Now why may not you and I surprise these knowing little creatures on some moving day? And when they become quietly settled down in their new quarters, we, too, can put a pane of glass into the front door of their underground home, and see for ourselves how they manage their household affairs; for it is always better to use our own eyes, so far as we are able, than to depend upon the stories that are told to us by others.

GROWLER'S PRIZE.

Two large falcons lived in the top of a tall pine tree. Their home was built in the fork of the tree, and was securely made; but, to say the least, it was a very rough and homely abode.

It was built of coarse sticks and leaves, and was lined with dry, loose bark.

Within the nest were five quite large eggs of a dirty bluish color, blotched with brown. The female bird guarded these eggs with so much care that she would scarcely leave them, even for a few moments at a time.

So her mate had to provide food for her, as well as for himself, and it kept him constantly on the wing; for the mistress of the house had an excellent appetite, and she wanted the very best thing that could be found in the market.

Mr. Falcon was a strong, fine-looking fellow, with a bold, dashing air about him, upon which he really seemed to pride himself.

In fact, — it may as well be told first as last, — Mr. Falcon's common, everyday name was "chicken hawk"; and you have no doubt heard of him many a time; for he was a fierce highway robber by trade, and he understood his business well.

He was dressed in a thick, heavy suit of bluish gray, with a dark head covering. He wore white about his throat; but his breast and his sides were handsomely flecked with light, yellowish red.

His rounded tail was marked above, with four, very dark, brown bands; while the under part and the tips of the tail feathers were white.



The Chicken Hawks
with their Prize.

His mate
was even
larger than
he, and was

clad in about sharp, curved they both went proudly soaring through forest and field, it is no wonder that the smaller and weaker birds about them quaked with fear.

Mr. Falcon sat on a bough near the nest, dressing his plumage with great care. At length, he said to his mate, "I am going out, my dear; what would you like for your dinner?"

"I have been thinking," she replied, "that a nice

chicken pie would not come amiss." And as she spoke she snapped her curved, horny bill several times, as if she could already taste the flavor of the fine treat in store for her.

"I am getting very tired," she added, "of frogs and squirrels and field mice,—and as for a grasshopper or a cricket, I fairly loathe the sight of one."

"Very well," answered Mr. Falcon, with an assuring tone, "very well; have what you like," and he stretched his long, narrow wings, and was off in a jiffy.

Now it so happened that a mother hen and her brood of half-grown chickens were also ranging the fields that day in search of a good dinner.

There had been a little shower the night before, just enough to moisten the earth; and it had brought to the surface of the ground many a fat prize in the shape of a grub or a worm.

So there was a rich repast spread out for that hungry family, and what was best of all, they did not even have to scratch for it!

Grasshoppers, crickets, angleworms, and grubs, all on one bill of fare,—that was a luxury indeed!

Now who could expect the watchful mother hen to turn away from such a feast as that, in order to gaze upwards at the clouds. But it might have

saved her a vast amount of trouble and of fright if she had done so.

For see! there is a dark form swooping down with noiseless wings just above her head. Suddenly she becomes aware of the danger, and her feathers are so ruffled that she looks twice her natural size.

“Cluck! cluck!” she calls in her very sharpest tones of command; and her frightened family understand, too well, that signal of alarm, for they have heard it before.

Not less than three of their number have already been seized and borne away by the terrible claws that are now reaching down after another.

Hither and thither they run, in all directions, not knowing, in their fright, which way to go; and there seems to be no means of escape for them.

The terror-stricken mother clucks and calls, and seeks for a hiding place, in vain.

Alas, has she discovered the danger too late? For now the fierce talons of the robber are about to fasten upon another of her luckless brood.

“Bang! bang!” what a cloud of smoke! But it clears away, and there stands a hunter with a gun in his hand.

But he did not bring down the bold robber, after

all; for do you not hear that shrill screech of defiance as he disappears from view?

With all possible speed, the old hen and her chickens hasten back to the barnyard, well content to dine on the simplest fare, rather than to risk their lives for the more choice tidbits of the field.

On the top of an old stump, in the middle of a quiet stream, sits the falcon, perfectly composed, with not so much as one feather of his fine plumage out of place.

A mother duck and her young ones are moving quietly about on the surface of the water, entirely unconscious of danger. Their webbed feet are made for swimming, and they enjoy it. All at once the mother discovers her enemy, sitting there so still, on the old stump.

She gives the alarm, dives to the bottom, and in a twinkling, every little duckling disappears with her. She swims away from her family, quite a little distance, and then comes to the top, hoping the falcon will make a dash at her, instead of at the little ones.

But he is too wise a bird for that; he has watched these swimmers, many a time, and he understands their ways.

He knows that the ducklings can not swim very far under the water, and that they will soon come

to the surface for air, very near the place where they went down; so he keeps his eye on the spot.

For he says to himself, "Since Mrs. Falcon has been cheated out of her chicken pie, nothing less than a nice plump duckling can fill its place." And he patiently watches his chance.

Pretty soon up comes a small, downy head; then another, and another.

The mother duck tries, but all in vain, to attract his attention to herself; for he suddenly leaves his perch and sweeps down till he almost touches the water with his wings. Then he stretches out his long claws. But again is heard the "bang! bang!" of a gun.

And when the smoke clears away this time, there lies the wounded falcon, struggling to rise from the water; but he finds himself helpless, with a broken wing.

Just at this point comes a loud "quack, quack," that sounds exactly like a mocking laugh, and the old duck and her brood make swiftly for the shore.

"Here, Growler," calls the hunter, and with a glad bound the dog springs into the stream and brings his prize to land.

The hunter carries it home and carefully removes the skin in order to prepare it for his cabinet, for he is a collector of birds.

And there sits Mr. Falcon now, mounted on his perch, with outstretched wings, and as I glance up at him, he stares fiercely at me, with two immovable glass eyes.

As for his body, that was thrown to the dogs; and when Growler seized upon his share of it, there was a low, husky chuckle in his voice as he said to himself, "Ah, this is a chicken pie worth having."



A Groundbird's Nest.

THE REAL CULPRIT.

In a low, grassy meadow, one morning I found

Such a soft, little, snug, mossy nest;

And within it, four eggs of the shade of the
ground, —

Ah, — but wait till I tell you the rest.

First, a nimble red squirrel ran down from a tree,
 But he did not peep in at the nest;
 He just cracked a few nuts and winked slyly at
 me, —
 Ah, — but wait till I tell you the rest.

Next, a shining, green snake crept so near, that
 alas,
 I had fears for that snug little nest;
 But he glided away through the tall meadow
 grass,
 And, — but wait till I tell you the rest!

Then I heard the soft tread of a shy meadow
 mouse,
 But she swiftly sped on, past the nest,
 In her search of sweet nuts for her winter store-
 house,
 And, — but wait till I tell you the rest.

For at last, a young truant from school passed that
 way,
 And his quick eye discovered the nest;
 And now a poor mother bird cries all the day, —
 Shall I leave her to tell you the rest?

HISTORY OF A BUG.

Do you know the difference between a bug and a beetle? Some people do not; and they call every insect that chances to come in their way a bug.

Now a bug has a slender, horny beak that is made for sucking fluids; sometimes it is used for sucking up the juice of a plant, and sometimes for drawing out the blood of an animal.

Bugs are very troublesome creatures; and most of them give out a bad odor. All the lice that are found, either upon animals or upon plants, belong to the bug family.

There are a few kinds of bugs that have no wings at all; but the greater part of them have two wing covers; and underneath these are two very thin wings that are used in flying.

The hind part of each wing cover is quite thin and clear; while the fore part is so thick that the light can not shine through it.

The larval babies that hatch from the eggs of a bug are very much like the full-grown insects, excepting that their small wing pads look like little scales upon the top of their backs; but they eat and grow, and cast off their skins from time to time, till they soon become as large as their parents.

Here is a bug that I found upon the leaf of a squash vine in the garden. The leaf was wrinkled and withered; and when I looked at it closely, I discovered that it was full of fine holes.

What was the cause of it?

Ah, Mr. Squash Bug could answer that question, if he could only speak through that sharp, horny, sucking tube that now lies bent backward beneath his breast.



The Squash Bug.

It is well that I caught him this bright autumn day, for to-morrow he might have hidden himself away in a wall or fence, and there he would have taken a long winter nap.

Let us look at him. His body is rather more than half an inch in length, of a rusty, black color above, and of a dirty, yellow shade beneath.

Surely, he has no good reason for being proud of his coat, — and what an odor!

On each side of the head there is a large compound eye, and on the back part of his head there are two small, single eyes that shine like glass. His two-jointed antennæ are quite long, as you can see, and there is a knob at the end of each of them.

Now look at his wing covers. They are placed

crosswise upon his back, so as to overlap each other at the tips ; and the soft, thin wings that lie underneath them are placed crosswise in the same way.

Do they not remind you of the flaps of an envelope? I think they look something like the under side of an envelope after it is sealed.

This bug has six legs, with a sharp claw at the end of each ; and if you handle him roughly, you will soon find that he can give you a good nip with those claws ; but you need have no fear, it can not harm you.

The upper part of the abdomen is black, and has a soft, velvety look ; and see, it is marked quite prettily along each side with dots of yellow.

And now let us find out how this insect happened to be feasting upon the leaves of the squash vine in our garden.

Here is its family history: Quite late in the season, last fall, a number of the squash bug family left the vines, and hid themselves away in a safe place, where they seemed to go to sleep ; and there they stayed, without any food to eat, all winter.

But when spring returned, and the vines put forth their tender leaves again, these bugs came out of their hiding places and began to feast upon the leaves.

Their appetites were very keen, as you may sup-

pose, and they greedily sucked the juice of every leaf as they went along.

After they had feasted about a month, the mother squash bugs began to lay their eggs. These little eggs were round in shape, and quite flat; and they were laid in patches, here and there, upon the under side of the leaves, at night.

In order to make them secure, these careful mothers glued them fast, with a gummy fluid from their own bodies. It was not many days before the young bugs were hatched out, and what homely little things they were!

They had short, round bodies that were of a pale-ash color; and the joints of their large antennæ were quite flat.

They ate and ate, and grew very fast; and after casting off their skins a few times, they became as large as their parents.

For a few days, they lived together in little families; but they soon left the leaves on which they were hatched, and went from vine to vine, in search of more juicy food, while all the leaves that they left behind them became withered and brown.

Now, as you can well understand, these insects are among the most harmful of all the bug family; but since we have learned so much concerning their

habits, there is no good reason why we should not get rid of them.

If we are careful to watch our vines as soon as the young leaves put forth, we shall find the bugs before they have begun their feast; and if we closely examine the under parts of the leaves every morning, we shall find the bunches of eggs that the mother squash bugs so carefully glued to them the night before; and in this way, it will not take us very long to clear our vines of these unwelcome visitors.

HISTORY OF A BEETLE.

Now that we have taken a look at a bug, let us also take a look at a beetle; then we shall know whether bugs and beetles are as nearly alike as many people suppose them to be.

Here we have a "May bug," as it is generally called; but if we examine it, we shall find that it is not a bug at all.

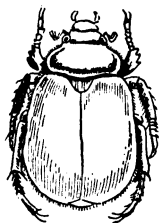
This insect is nearly an inch in length.

It has no sucking beak, for it needs none; it has two sets of strong, horny jaws, instead. These jaws are for cutting and biting the roots, stems, and leaves of plants; for there are only a few beetles

that live upon animal food, and such beetles usually prey upon other insects.

Look at it closely, and you will see that its jaws are made to move sidewise, and not up and down, like your own.

Its body is oval in form, and of a chestnut-brown color; but all beetles do not have this oval form. Some kinds of beetles have the body quite flat, and some of them have very beautiful colors, as well.



The Beetle.

Its stiff, hard, wing covers meet in a straight line upon its back; they do not lap over at the tips, like the wing covers of a bug.

Do you see that little wedge, where they are joined together at the base? It looks like a small gore set in there to hold the wings in place.

You can easily see that these wing cases are well sprinkled over with little dots, as if they had been pricked, here and there, with a fine needle; and there are three rough lines, running the whole length of each cover.

Underneath these wing covers are two, thin, silky wings, folded crosswise, and what a pretty shade of brown!

When these light wings are spread, then away

goes the beetle, darting about here and there in the twilight, and making a loud, buzzing sound with its wings, that is not at all pleasant to hear.

Have you noticed its pretty vest? See, it is clothed with a yellowish down.

Well, well, so our noisy May beetle comes out in quite a fine spring suit, after all !

Its antennæ are many-jointed, and there is a knob at the end of each one of them ; and you can plainly see that each knob is made up of three leaflike joints, as well.

Notice its two large, compound eyes. On the back of its head there are two simple eyes ; but these are so small that you will have to look closely to find them.

Now look at its six long legs ; they are well clothed with hairs, and each leg has a strong, double claw at the end of it.

When beetles of this kind light upon a tree, they cling to the leaves with their sharp claws. They belong to a class known as the tree beetles ; and it does not take a swarm of them very long to strip both the twigs and the branches of trees entirely bare of their foliage.

Did you notice three, jagged, toothlike points on the fore legs of this insect ? Let me tell you what they are used for.

The mother beetle makes a hole in the earth, and sometimes this hole is six inches in depth; and she uses her strong, jagged fore legs for digging.

In this hole she places her eggs, and very often there are as many as fifty or more of them; then she flies away and leaves them, for she knows they will be safe.

Soon after the eggs are laid, both the father and mother beetle die; they do not hide away and sleep through the winter as some other insects do.



Larva of the
Beetle.

Now let us see what becomes of the eggs that the mother beetle has placed in the ground with so much care. In about fourteen days, there comes forth from each egg a little, soft grub, having a round, white body and a small, brown head; and when this grub is at rest, it lies curled up, in the form of a half circle.

These larval babies are provided with six legs, and with a mouth that is armed with strong jaws, and oh, how greedy they are for something to eat!

During the warm, summer months they remain very near the surface of the ground, and gnaw the roots of every green thing that they can find; but as cold weather comes on, they go down deeper into the earth.

There they remain till the warm springtime returns; then they cast off their skins, and come up to the surface of the ground again for food.

These hungry creatures spend as many as three summers under the soil, in this way, before they have eaten all they want.

And then they go down still farther into the earth, as if they could not bury themselves deep enough; and there they enter the pupa state.

And when the springtime again rolls round, they creep up, for the last time, from the cold, damp earth; and casting aside their pupa skins, they come forth, active, brown-winged, buzzing May beetles, like their parents before them.

Many of these insects are often seen flying about in the month of June; and then they are commonly called "June bugs."

But they all belong to the same family, and every one of them is a destroyer of plant life.

DR. LEECH.

ONE half holiday, three school boys went to a small pond to catch some fish.

After they had fished awhile without getting so much as one nibble at the hook, they threw

off their clothing and plunged into the water for a bath.

Finally one of the lads swam out to an old stump that stood near the middle of the pond and climbed up on the top.

He had not been there very long, when his back, arms, and legs began to tingle, as if he had been stung by some small insect; and he soon found that his body was covered in places with tiny little things that looked like flat worms.

He was terror-stricken, and so were his mates, and they all ran towards home as fast as their legs would carry them.

Now the fact is, this old stump was the headquarters of

Dr. Leech and his large family of young ones; and a more bloodthirsty set of creatures was never known.

Indeed, they are often called bloodsuckers, and that is a good name for them.

The leech is an ugly, thick-skinned worm, having a very flat body that tapers at each end. Its color is generally dark, thickly mottled with light-brown dots.



The Leech.



Sucking Plate
of Leech.



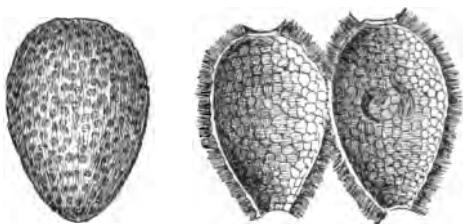
Jaw of Leech.

This creature has a sucking plate at each end of its body; and when it fastens itself upon the skin of any other animal, it is very hard to make it loosen its hold.

Its mouth is in the center of the forward plate, and is armed with three small teeth that are notched like the sharp edge of a saw.

So when the sucking plate has stretched the skin smooth and tight, the fine, sawlike teeth press down hard upon it, until three deep cuts are made, in the form of a triangle.¹

Then the leech draws the blood into its



Cocoons of the Leech.

stomach, and holds right on, till it has filled itself full. It is said that one of these creatures can eat enough at one meal to last a year.

With such a savage animal as that in the pond, it is no wonder that the lads caught no fish; for these hungry worms fairly drain both the frogs and the fishes of their very lifeblood; and when they can not find anything better, they will devour one another.

¹ A figure bounded by three lines and having three angles.

This leech worm lays about a dozen eggs in a gluey band that encircles the upper half of its body.

When all the eggs are laid, the worm withdraws itself from the band, which then closes up, forming a strong sac. This sac is the cocoon; it is oval in shape, about a quarter of an inch in length, and contains from six to sixteen eggs.

The egg cases of the leech may often be found in mud banks, and also in old logs and stumps that are in the water.

The baby bloodsuckers stay in their slimy cradles nearly a month; and then they begin to push hard, with their heads, against the walls of their cocoons, till some weak point gives way, and lets them out.

They are very thin little things at first, not a tenth of an inch in length, and no thicker than a fine thread. But they know well how to use their teeth, as the poor lad that visited the old stump that day could testify.

In winter, they are not seen; for they bury themselves under water, deep in the mud, till spring returns; then they come up more bloodthirsty than ever.

But we must give these ugly worms the credit of doing some good in the world; for they were formerly much used to draw out the impure blood of people who were sick.



A DIVIDED HOUSEHOLD.

PART I.

WHAT a noisy din and bustle there is in the domain of the queen honeybee to-day! I wonder what it all means. We will wait a little while and maybe we shall be able to learn more about it.

Ah, now I understand it; the bees are getting ready to swarm. Let me explain.

When honeybees swarm, a large number of them fly away from the hive, and the queen bee goes with them.

Now this queen and her subjects have a nice, large hive under that old apple tree in the garden; and one would suppose that they might all dwell together there in peace and harmony. But not so; for this morning there came a thin, piping sound from one of the cells, and there is just where the trouble began.

The moment the queen bee heard the sound, she said, "Ha, that is the voice of a young queen, I know it well, and I will not stay in this hive any longer; for one queen in a hive is enough."



A Bee's Sting.

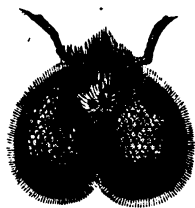
As she spoke, she darted a sharp piercer out of the end of her body, two or three times.

Now, strange to say, a queen bee will sting another queen to death, through jealousy and spite; but she never puts forth her sting to harm anything else.

Do you want to know how the queen bee looks? Like all insects, her body is made up of rings; her abdomen is long and slender and her wings are short.

Besides her two, great, compound eyes, she has three single eyes, and a long, slender tongue for lapping up sweets. But she never stores up the sweets that she gathers; for she does no work. She is mistress of the hive, and she lays all the eggs.

She is a born queen; for when she was an infant she lived on better fare than the other larval babies in the swarm. Is she to be blamed, then, that she will not divide her realm with another?



Head of a Bee, showing Compound Eyes, Simple Eyes, and Antennæ.

Ah, she will forsake the hive before she will do that; and when she goes away, more than half of her subjects will follow her. But what if she should die?

If there were more royal babies in the cells, a young queen would take her place. But should there chance to be none, then the bees would take a common larva and feed it with royal fare, and it would grow up to be a queen; for a household of



Queen.



Drone.



Worker.

this kind can not exist without a queen to lay its eggs.

The rich, sweet food that is fed to the queen larvæ is called "royal jelly."

"Come, come," says a busy little wax worker, "we must make all the haste that we can, for there will be plenty of new comb to build up."

She has her wax baskets already filled; they are on the under part of her abdomen.

Every time she eats a morsel of food, a portion of it is changed into oil; this oil soon hardens and

forms thin scales of wax upon the rings of her abdomen and on the under side of her body.

These rings are her wax baskets.

How strange that the oil upon the inside of her body should find its way to the outside and harden into wax!

But it is still more strange that after she has changed other portions of her food into clear, sweet honey, she should be able to draw it up from her stomach, back into her mouth again, so as to store it away in the white cups of the comb.

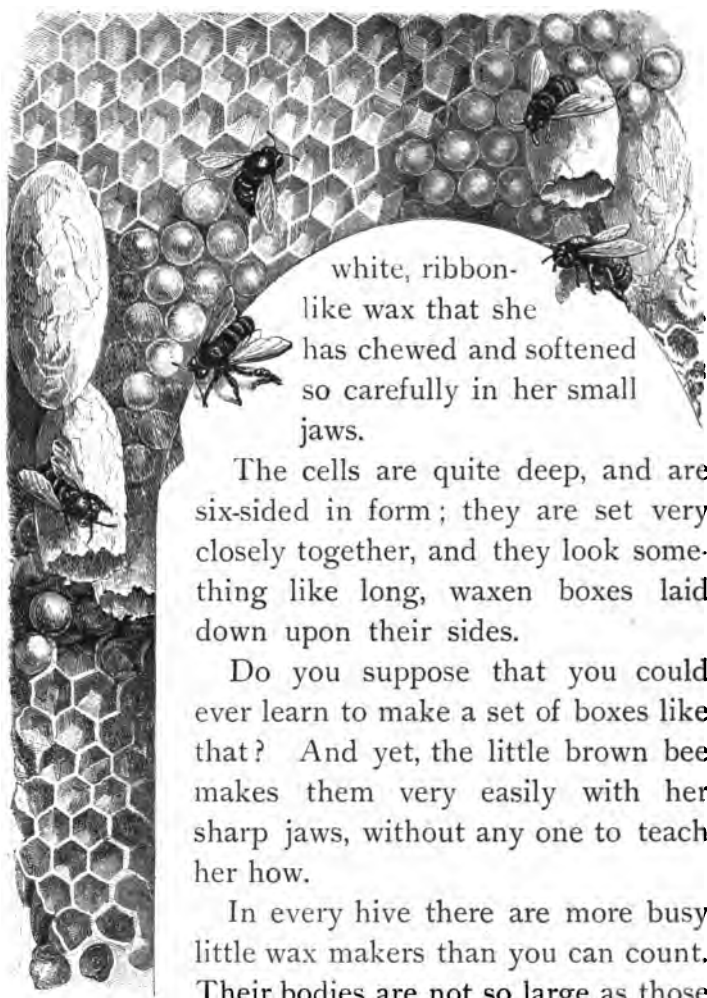
Now when the baskets of the little wax maker are full, what does she do?

On her hind legs there is a small, hairy brush or scraper, and with this she scrapes the wax from her baskets and passes it forward to her jaws with her fore feet.

Then she chews it, and makes it very soft, and when she draws it through her mouth, it comes out like a white satin ribbon; then it is all ready to be worked into honeycomb.

If you examine a piece of the comb, you will see that it is made up of a double row of cells, placed back to back, in such a way that it forms quite a thick middle wall of wax between the two rows.

This wall is the base of the cells; and here the little bee first begins to work with the fine strip of



white, ribbon-like wax that she has chewed and softened so carefully in her small jaws.

The cells are quite deep, and are six-sided in form; they are set very closely together, and they look something like long, waxen boxes laid down upon their sides.

Do you suppose that you could ever learn to make a set of boxes like that? And yet, the little brown bee makes them very easily with her sharp jaws, without any one to teach her how.

In every hive there are more busy little wax makers than you can count. Their bodies are not so large as those of the queen; but their wings are larger and stronger than hers.

Honeycomb,
showing different cells.

And they need just such strong wings as they have; for they must fly, far and wide, in search of sweets to make their clear honey, and to furnish wax for the comb.

These busy little creatures are well named the "workers" in the hive, since they both make the cells and fill them with honey for their winter store.

But the cells are not all of the same size; neither are they all used for the same purpose.

Some of them are made for holding honey; others are for the queen bee to lay her eggs in; and others, still, are for storing a kind of food called beebread.

This beebread is a sticky mass that the bees make of a fine dust, called pollen, which they gather from flowers; the bread is of a dark-brown color, and is not sweet to the taste.

The queen bee lays her eggs in three separate sets of cells, placing one egg in each cell.

She first lays some eggs in the small cells that are used for hatching out workers; then she lays some more eggs in a set of larger cells that are built for hatching out thick, stout-bodied bees called "drones."

These drones have no stings, and they do not gather honey. They are the father bees in the hive; while the queen bee is the mother.

Finally she lays a few eggs in some large, flask-shaped cells that are built on the edge of the comb. When the comb becomes old, these cells are dark-colored, and they look like large peanuts hanging there.

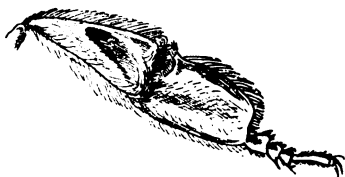
These are queen cells, and there are not very many of them; but all of the other cells are smaller than these, and are made six-sided, as I have told you.

A DIVIDED HOUSEHOLD.

PART II.

So the little wax worker was right. There will be a good deal of new comb to be made; but she will have thousands of helpers all around her.

And there will be thousands of others, carrying baskets of pollen for bee-bread, on which the larval babies are reared.



Leg of Worker.

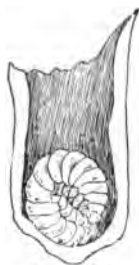
Between the joints of each hind leg there is a small space, hidden by short, stiff hairs; and these are the little baskets that hold the pollen.

When a busy worker comes out of a deep flower, she looks like a dusty miller, only the dust that

clings to her body is often quite yellow; but she has a little tuft of hairs on one of her legs, and with this she brushes the pollen from her body and stores it in her baskets, where it belongs.

Oh, she starts out for her day's work well prepared, as you can see, and she never loses her baskets on the way, either.

Now in every hive or colony of bees there are more worker cells than any other kind. For it is the busy workers that make up the colony; and among these there are a great many that act as nurses in the hive; and it is these nurse bees that take charge of the larval babies, and feed them when they are hungry.



Larva of Bee.

As these baby bees lie curled up in their cells, they look like little white worms; and when they are in need of food the nurses chew some beebread very fine and soft, and feed it to them from their own jaws.

But when they have eaten all they want, they no longer lie curled up in the cell; so when the nurses see that these larval babies have straightened out their small bodies, they put a thin cap of wax over each cell, and then each baby spins a silken cocoon about itself, and goes to sleep, in its pretty waxen cradle.

It takes about twenty-one days for a worker bee to hatch from the egg; and then it casts aside its silken wrap, gnaws open the waxen cover, and comes out with four thin wings.

It takes only sixteen days for the young queens to hatch out; but the drone bees are about twenty-four days in hatching.

Sometimes the worker babies have to struggle very hard to come forth; but the nurse bees always help the royal infants out.

When a young bee first comes out of its cell, both its body and its wings are of a very pale-brown shade, and it seems to be rather weak in its legs; but it begins at once to creep about over the comb, and when it comes to a cell that contains honey, it stops and takes its first meal of the sweet food.

Many of the honey cells are left open a week or more after they are filled; for the bees will not cap them over with wax until they know that the honey in them is "ripe," or ready to be sealed up. So it is always easy for the young bee to find an open cell where it can eat all it wants.

But it does not feed upon the stored honey very long; for in a day or two it has the full use of its wings, and then away it goes to gather sweets from the flowers, just like the older bees.

And it is well that it begins its work at once; for the length of a worker's life is but a few months at most, and some of them live only a few weeks. But a queen bee has been known to live four or five years.

As for the drones, the greater number of them are driven out of the hive by the workers; and as they can not gather honey, they are left to starve; and if they attempt to return to the hive, the workers often fall upon them, and sting them to death.

Do you not pity these poor father bees? I do. But the busy workers are very eager to store up a good supply of honey for their winter use; and they will not share this precious store with the drones.

A great many bees in the hive die during the winter; but the queen bee begins to lay her eggs very early in the spring, and these eggs hatch out so fast that the number in the hive is soon as large as ever.

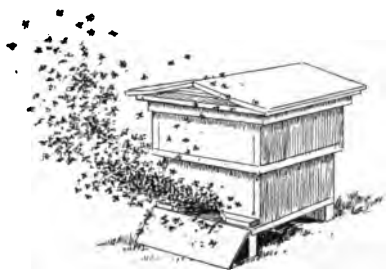
She wanders about over the comb in search of cells that the workers have prepared for her eggs; for she does not lay eggs in every empty cell that comes in her way.

She knows at once which are the egg cells, and when she comes to one of them, she lowers the tip

of her abdomen into it, and drops an egg; and she goes from cell to cell, laying about three thousand eggs a day.

And so the hive is always full; for a large number of young bees come out of the cells every day during the hatching season, which lasts through the warm summer months.

But as soon as a young queen is hatched out, the old queen leaves the hive, and a large number of subjects follow her, as we find them doing now; and should a number of young queens be hatched out at the same time, only one would be permitted to remain with the colony.



A Bee Hive.

The others would be taken out, and put into other hives that had lost their queen, or into a newly-formed colony made from a swarm that was too large for one hive.

For new swarms may be hived very easily, if they can have a queen among them to lay the eggs.

But we have already learned that one queen is enough; and if the new queens are not removed as soon as they come out of their cells, the ruling

queen will seek them out, and sting them to death. And on this account, the owner of a beehive keeps a very close watch over the royal cells, in the hatching season, and examines them every few hours of the day.

But see! our queen has gathered her subjects around her in a black, buzzing mass, on the limb of an old apple tree.

They are planning now which way they will go. And perhaps they will fly away to the woods, and make their home in a hollow tree or stump; then they will become "wild bees."

So we will spread a white cloth under the apple trees. Bees have a very keen sense of sight, and they will notice the cloth at once; then we will put some honeycomb in an empty hive, and set the hive down on two small blocks upon the white cloth.

This will give the bees a chance to go in at the bottom of the box; they will be glad enough to move into a new house where there is some nice honeycomb to begin with.

But if they are too long about it, we will saw off the limb on which they rest, and let it go to the ground, very gently; then they can peep in at the open door of the new hive.

But these insects have such a strong sense of

smell that they do not need to see the honeycomb, for they can smell it afar off.

So the old queen and the new one will be neighbors, after all; but each one will control her own household, and there will be no more cause for war.

BORN IN A DITCH.

Do you see that elegant dragon fly winging her way through the air? How she loves the light of the sun!

Her head is very large, and she has two enormous compound eyes, as you can plainly see.

But she does not move them; for insects are not able to roll their eyes about as you do.

Her beautiful wings are so finely veined that they look as if they were made of clear, thin gauze; while all four of them are barred across the center with a rich, golden brown.

Now she stops and lights on the top of a tall reed that grows by the border of the ditch.

See, she pushes the end of her body down into the water, and glues a bunch of little, yellow eggs to

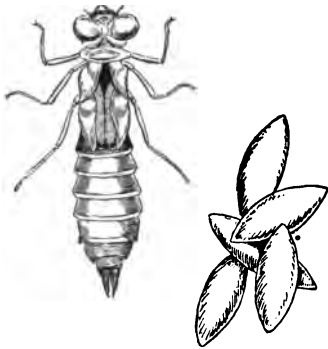


The Dragon Fly.

the root of the reed. Now her work is done, and away she flies.

A few weeks later, these eggs will hatch out. What will her infants be like? They will not look like her, I can assure you; for the larval babies of the dragon fly are ugly things to behold.

It is true, each baby has a very large head, two large compound eyes, and a pair of single eyes, besides; but it has six, sprawling, spiderlike legs, and no wings at all.



Larva and Eggs of the Dragon Fly.

Moreover, the lower part of the face is covered with a mask; under this mask is hidden a fierce pair of jaws that resemble two sharp hooks.

These greedy creatures creep about the pond or the ditch in which they live, and feed upon other larval babies.

They look so innocent and so harmless under this mask, that their poor victims seem to have no fear of them whatever.

But woe betide the young tadpole, or the tiny baby fish that crosses their path; for it will be snatched up in an instant.

So they eat and eat, and become so stout that they have to shed their coats many times.

At last, some small wing pads appear; then the larvæ change to the pupal form; and after a time, they crawl up to the top of a reed, or of a stem, and burst open the pupa skin.

Then they are all ready for a life in the sunshine and in the open air; and, oh, how swiftly and gracefully they go sailing about on their rainbow-tinted wings!

The dragon fly has some cousins whose small wings are still more beautiful than her own. These insects belong to the same great family.¹

They are called lacewings; but they give out such a disagreeable odor, when disturbed, that no one cares to go very near them. They are not fond of the sunshine; they like better to dart about in the twilight or even in the light of the moon.

The dragon fly is sometimes called the devil's darning needle; and some foolish people are really afraid of her, lest she may "sew up" their ears.

But you need not fear to take her in your hand. She has no sting at the end of her body; and if she should chance to give you a sharp nip with her jaws, it would not harm you in the least.

It will be only a quick, little pinch, that you will

¹ Neu-rop'te-ra, nerve wing.

hardly feel at all; but you must handle her very carefully, or she may bite off the end of her own body in trying to escape.

It is generally better to place such an insect as this under a glass dish, and look at it carefully from the outside. Then no harm can come to it; for you may regard it as your friend; and when you see it flying about in the hot sunshine, you may know that it is in search of other insects that destroy your plants and flowers.

Therefore we will all look upon this handsome creature with a feeling of real friendship, even if she was born in the bottom of a slimy ditch.

"I TOLD YOU SO."

A PAIR of handsome bluebirds were hopping briskly about, side by side, along the furrows of a newly plowed garden.

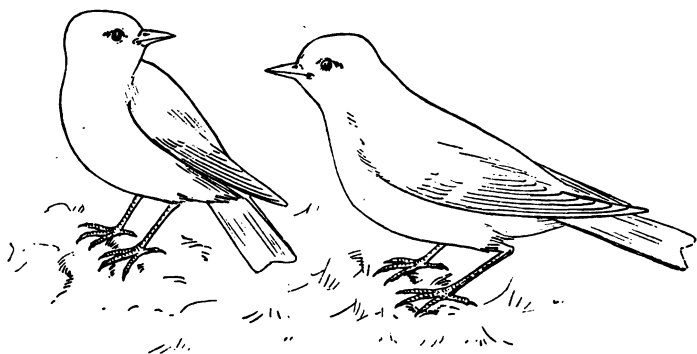
They had been so busily engaged in picking up choice tidbits from the freshly turned soil that neither of them had spoken a word for several minutes.

Both of these birds were showily clad in bright, azure blue, and both of them wore white on the under parts.

But the glossy plumage of the male was a trifle darker than that of his mate; and the reddish-brown tint of his fore neck and sides was a little brighter than hers; the feet, as well as the bills of both birds, were black.

At last Mrs. Bluebird broke the silence.

"I can not see," said she, "why you object to



Bluebirds.

making the nest in that old, hollow stump; for I am sure it is as cozy a place as we can find."

Mr. Bluebird swallowed several fat, wriggling larvæ, before he made any reply.

Then he cleared his throat a little and said, "But, my dear, have you forgotten the jays and the crows that we saw in that neighborhood yesterday?"

"Then, too, there are the rats and weasels that are prowling about there all the time. No, I am in

favor of taking possession of that fine martin box under the bough yonder; it is roomy and safe, and think of the time that will be saved in building the nest."

"Yes, and be driven out of it by the English sparrows as soon as it is made," answered Mistress Bluebird, in a short, querulous tone.

"I never can be happy a moment in that martin box," she continued; "and if I have to go over there against my will, I am quite sure that not one of my eggs will ever hatch out."

There was a little more sharp discussion between them, and then both birds rose from the ground and flew directly toward the old, mossy stump.



Bluebirds' Nest.

The mistress of the household had gained the day, and the work of building soon began.

The nest was not very tastefully built; but it was lined with

some soft grass, a few feathers, and a bit of wool, and was quite comfortable.

Not long afterwards, there were five light-blue eggs laid within it, and everything seemed to go well.

But before the mistress settled down to steady domestic care, the happy couple must needs go forth together for a little outing; so away they sped to their old luncheon quarters in the garden.

But who is this that comes peeping into their door while they are away? Is it some ill-bred country cousin?

He is clothed in blue; but his body is nearly twice the length of the bluebird, and is of a light, purplish shade, while his wings are of a still deeper tint, barred with black lines, and tipped, here and there, with white.

He wears a jaunty tufted cap on his head, a patch of white down at the throat, and a narrow black collar that is quite high in the neck behind.

The twelve feathers of his rounded tail are barred with black lines, and tipped at the ends with white.

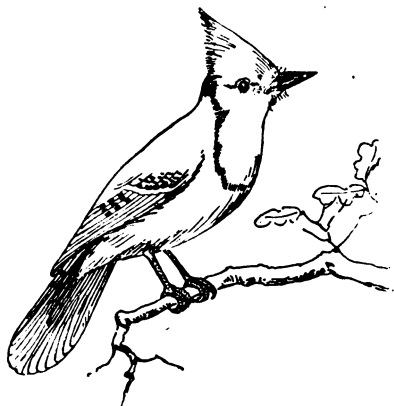
He is very handsomely dressed, — but what manners!

For, without waiting for an invitation, he flies straight in at the door! And what can he be doing there so long, with no one to entertain him?

Now he comes out, lights on the top of the stump, and utters a shrill cry, — “jay-jay-jay,” — as much as to say, “Yes, that is my name. I am the thief that

sucked those little blue eggs, and left nothing but empty shells behind!" and away he goes to break up some other home.

By and by, the owners of the nest return. The mother bird enters the house at once, while her mate alights on the stump, and warbles a low, soft tune.



The Blue Jay.

But what is all this bustle about? Mistress Bluebird flies swiftly out at the door, and in an agitated tone calls her mate to "just come and look here!"

Then she goes back, and he darts in after her, and then they both come out again, and cast quick, searching looks all around them; and pretty soon they return to the nest, to make themselves sure that there is no mistake about it.

But it is too sadly true. Some winged robber has stolen into their quiet home and left nothing behind him but empty shells. It is hard to believe it, but there is no chance for doubt; so they must seek new quarters and begin all over again.

Now they fly to the open door of the martin house, and this time Mistress Bluebird raises no objections; for she is so mute with grief and disappointment that she is willing to go anywhere.

They soon build another cozy nest, and again five light-blue eggs are laid within it; and the little housekeeper at once settles down to her duties.

Her mate goes forth on glad wings and brings her all the rare morsels that he can find, and gives her, now and then, a kiss in the bargain.

Finally there comes a faint "peep, peep" from five tiny bills, and then who can be happier than the joint owners of that household?

Mistress Bluebird seems to have almost entirely forgotten her sorrow; and as for the master of the house, he warbles a song so full of melody that it does seem as if he must have a real Swiss music box hidden away under his glossy breast.

His wife responds with a low, happy chirrup, and says, "How glad I am that *we* chose this martin box; it is just the place for us, so roomy and so safe, withal."

And he tries to keep down a sly, liquid chuckle, as he replies, "I told you so, my dear; I told you so!"

ALWAYS AT HOME.

ONE morning, a noisy drone honeybee was buzzing about among some sweet clover blossoms, when

all at once he came upon a slow-plodding snail.

"You poor thing," said he; "how I do pity you!"

"Pray why do you pity me?" answered the snail, "I have no need of your pity."

"Because I never see you without that heavy burden on your shoulders; and I am sure it must take you at least a whole week to get across this small patch of clover, while I go over and over it many times a day.



The Honeybee.

"Just look at my four light wings now! Is it any

wonder that I know all about this field of clover?"

At this the snail stretched out two long horns. In the end of each horn was an eye; and she wanted to see for herself the drone's gauzy wings.

"Your wings are very good," she said, "but I am better off without them; for I can travel as fast as I care to with one foot."

"Only one foot, and no wings at all?" said the drone. "Really I pity you now more than ever. But tell me, how long have you carried that heavy shell on your back?"

"Longer than I can well remember," answered the snail, "for I was born in it."

"Born in it?" said the drone, in a tone of great surprise. "You do not mean to tell me that you went about with a house on your back when you were a mere infant?"



The Snail.

"It was not so large then as it is now," replied the other, "for at first it had but one small room at the top. But as I grew larger, I built more rooms, till now my little house is large enough; for it is five stories high."

"I do not find it heavy to carry about either, for I am used to it; and when I am tired, I have only to creep backwards into my house and rest myself."

"But how can you gather honey and other sweets from the flowers?" asked the drone.

"I do not live upon honey, as you do," replied the snail. "Both my tongue and my upper lip are covered with fine, sharp teeth; and with these I scrape up and eat the soft part of green leaves and other juicy plants that come in my way."

The drone was silent for a little time, and then he said: "But I do not see how you happened to be born in the very *top* of that house of yours."

"I will tell you," said the snail. "My mother laid a number of small, white eggs in the earth; and when the babies hatched out, they each had a little home of their own, like the top of this house of mine; and as they grew older, they made it larger, as I have done."

"Well, well," said the other, "so the top of your house was built first; and you have never been away from home in your life,—how stupid that must be! For my part, I love a life on the wing, and I never grow tired of it—never. But what will you do with yourself when winter sets in?"

"I can pour out from my body a sticky fluid that will dry and make a thick, strong door for my house; and I will stay inside of it, snug and safe, all through the cold winter, and when I want to come out I can push the door open with my foot."

The drone went buzzing about for a long time; then he came back with another question.

"Now what would you do," said he, "if an enemy should come to your door?"

"My enemies can not harm me," said she; "for I can dodge quickly back into my house, and close the door with a soft, pink curtain that I have."

"I wish I had a house to hide in," said the other; "for I have no sting at all in the end of my body, such as the worker bees have in theirs, and if they choose, they can fall upon me at any time and sting me to death."

"Why should they do such a cruel thing as that?" asked the snail.

"Because they are too stingy to share their honey with me," said the other.

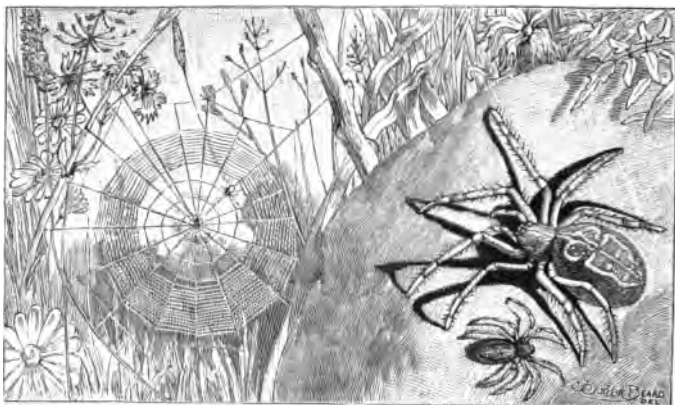
"But why do you not gather honey for yourself?"

"Oh, that is not my trade. I was not made to gather honey, and I do not know how; so I like to fly about in the sunshine, and —"

The poor drone did not have time to finish his sentence; for at that moment, two small worker bees chanced to spy him.

The snail quickly drew in her horns, and when she looked out again, the drone lay dead and helpless on the ground.

"So much for being always on the wing," said she. "For my part, I would rather stay at home all the days of my life."



The Garden Spider.

A SKILLFUL SPINNER.

HAVE you ever watched the cunning spider as she makes the strong silken nest for her eggs and spins her pretty lace snares in the corner of your room or across the windowpane?

As you see her at work, you may wonder what use she can possibly have for so many legs; for there are eight of them in all, and if you look at them closely, you will see that they are many-jointed, and covered with stiff hairs.

Ah, the poor fly that is caught in her snare would explain it to you, if he could only speak; for, as she glares at him with her eight beadlike eyes, she

weaves him a shroud, at the same time, with her eight busy feet.

Her third pair of legs are the shortest, and with these she holds the helpless insect and turns him over and over, — upon his face and upon his back, just whichever pleases her best; in fact, she seems to use these short legs in the place of hands.

The silken thread with which she shrouds the fly is drawn from some small tubes upon the under side of her abdomen, very near the end.

These tubes are the spinnerets, or spools, out of which flows a clear, sticky fluid. She draws out this fluid in a very fine stream and guides it with her hind pair of feet. The air dries and hardens it at once, and it then becomes a fine, silken thread.



Spinnerets.

When the spinning tubes are kept apart, many single threads may be formed; but when they are held close together, they are all blended into one band.

As she pulls it out, — not “hand over hand” exactly, but “foot over foot,” she winds it round and round the body of the poor fly, till it can not help itself at all.

Then she hangs it up in her web, to suck its

juices whenever she gets hungry. If anything touches her web, she knows it at once; and draws in all her feet towards her body, so as to tighten the threads of her snare.

So you see she does have use for every one of those eight bristly legs of hers, after all.

You have already learned that the body of an insect is divided into three parts; but if you look closely at a spider, you will see that the head is joined to the thorax, without any neck between them.

So we may not speak of the spider as an insect. There are a few insects that have not a very long neck, but their heads are not set closely to the thorax like that of the spider.

The eyes of a spider are usually eight in number; and they are placed on the top of the head in two rows, with four eyes in each row. Spiders can not move their eyes; but they have so many of them that they can look in all directions at once.

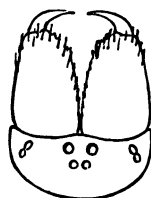
The mouth parts of a spider consist of an upper and a lower lip, and two pairs of strong jaws. The two upper jaws are placed side by side; and the two lower jaws are set close together in the same way.

The upper jaws are curved, and are quite stiff and horny. These jaws are the spider's fangs; and

at the base of each fang there is a small sac that is filled with poison.

The lower pair of jaws is smaller than the upper pair, and not quite as strong.

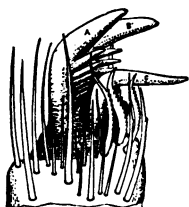
On each side of the lower pair of jaws there is a five-jointed member that looks something like a spider's leg, only it is very much shorter; these are its feelers, and with these short feelers it seizes its prey.



A Spider's Jaws.

At the end of each bristly leg, there is a claw, well covered with stiff hairs; and with these hair-covered claws the spider can creep up a very smooth wall.

But if it wants to get down from a high wall, or from the branch of a tree, it fastens one end of a thread there, and then lets itself down to the ground.



A Spider's Foot.

Nearly all spiders build snares; but the mother spider makes a much better net than that of her mate. Once in awhile a father and a mother spider may be found living in the same web; but this does not often happen.

Young spiders spin very small webs, but their work is perfect.

Many of the webs that we see are round in form; and the spiders that make them are called orb weavers, because the word "orb" means "circle."

And now let us learn something about the work of the little orb weaver.

When this spider finds a good place for her orb, she first spins some strong lines to make a framework; this framework often has four sides, and sometimes it has even more, and the lines of which it is spun are made up of five or six silken threads.

Then across this framework, she spins a few strong lines, from corner to corner. Now her foundation is laid; and from its center, she spins a number of fine threads, and fastens the end of each thread to the sides of her framework.

These fine threads stretch out from the center of the web, somewhat as the spokes of a wheel reach toward the hub; but they are not always the same distance apart from one another. These threads are called the rays of the web.

Now she begins at the center again, and spins a thread across the rays; and as she goes round and round toward the outside lines of her framework, she glues her threads to each fine ray. These threads are called spiral lines, because they wind round and round.

But her web is not yet complete; for she must now spin some more spiral lines in the spaces between those that are already done, and these last threads that she spins are covered with small gluey specks that look like little beads.

Ah, it is these small, sticky beads that hold the poor insects fast when they chance to light upon the snare.

And now Mistress Spider is ready to take her place on the web, where, with head downward, she awaits her prey. It will not be very long before a fly or a moth will venture to step upon one of the silken threads.

Then it will struggle to free itself, and the gluey beads of the fine spiral lines will melt upon its wings or upon its legs, and Mistress Spider will see to the rest.

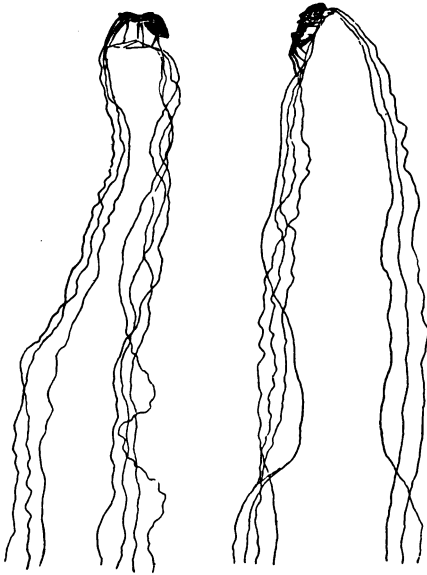
She has already woven her egg case; it is a round silken cocoon, and she guards it with great care. Sometimes it is made fast to the corner of a window near where she spins her web.

Some spiders carry the cocoon about with them; and when the young spiders are hatched out, they ride about upon their mother's back.

Spiders molt, or cast off their skins, six times before they become full-grown; so when they get their seventh suit, that is the last.

Many spiders hide themselves away during the winter months; and that is why they are so often seen spinning their webs so early in the spring.

Although most spiders do not live more than a year, yet some kinds have been known to live much longer.



Spider Balloons.

The spiders that we see about us, in outhouses, in garden, and fields, are harmless creatures; they will not bite us; and even if they should nip us with their small jaws, it would do us no harm.

And they can build rafts and sail upon the water; and they can throw out threads upon the air and make little balloons that will carry them up as high as the top of a tall tree.

They can even build silken bridges across streams; and do many wonderful things, as we shall find out if we watch them.



A DEVOTED MOTHER.

AND now let me tell you about a very large spider named the ta-ran'-tu-la.

She lived in a wooden box, having a glass cover; but she did not stay there from choice, for she was a prisoner.

When she was at home, she led a wandering life and ran about over rocks and stones in the woods and fields in search of her prey.

Tarantulas.

She has some relations that live in holes in the ground, and that line the walls of their underground homes with silken curtains of their own spinning. And there are others

among them that close the top of their holes with a round trapdoor that is both lined and hinged with strong silk.

Both the body and the legs of this tarantula were covered with short, stiff hairs of a dark-brown color; and the joints of her legs were so clear that they looked like thin scales of mica.

Like all other spiders, she was an ugly hunch-back; for the head and body were joined together without any neck between them.

On the top of her head were eight, beadlike eyes, arranged in double rows; and she had strong, sharp jaws, with a poison fang at the base; and hidden within her head was a small poison gland.

She knew well how to use her ugly jaws; for when a living insect was thrown into her cage she would pounce upon it fiercely. Then she would tear its wings from its body, and crush it between her jaws without farther delay.

One day a dead and withered locust was given her; and when she saw that it was hard and dry, she carried it to her dish of water and soaked it well before she tried to eat it. How could she know that dry crusts are made softer by being soaked in water?

Very soon after this, Mrs. Tarantula began to spin some soft white threads across the inside

cover of her box. These threads she fastened, here and there, with a little tuft of silk, so that the whole thing looked very much like a patch of thin, dotted muslin, only that it was finer and more glossy.

This was the foundation of her cocoon; and when it was well laid, she deposited her eggs there, and inclosed them with a closely-spun covering.

The cocoon was nearly round in form, and as white and glossy as a white satin cushion.

When it was completed, she placed her body over it, and stretched out her eight long legs, so that her feet pressed closely against the foundation lines of her egg case.

From that time, she would neither eat nor drink, and if she ever slept at all, it must have been with one eye closed, and the other seven eyes wide open.

It was in vain to try to tempt her with large juicy insects, or with any other rare dainties of the kind; for her motherly heart was dead to everything in the world excepting the care of that precious egg basket.

Every day the cocoon increased in size; and every day the faithful sentinel that guarded it grew weaker.

And finally, after she had fasted for two whole months, she was no longer able to hold herself upon the nest; and one day she fell to the bottom of the box, too weak and helpless to move a limb; and in a few hours more this devoted mother spider was dead.

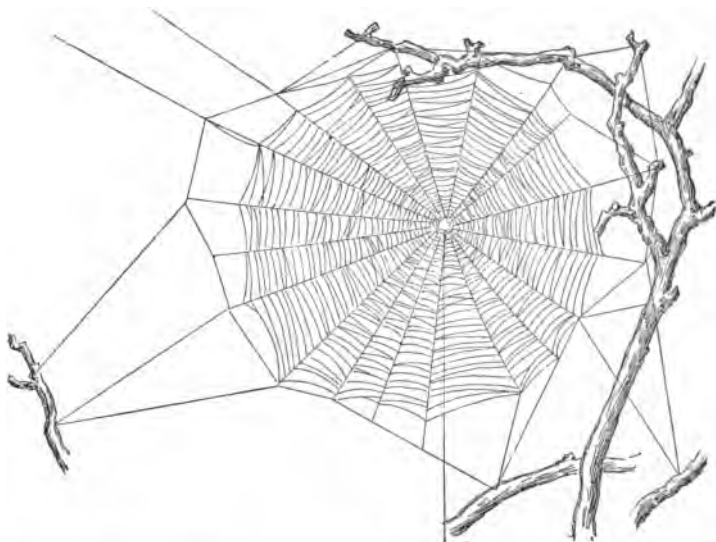
I am sorry to tell you that the eggs did not hatch out; the young spiders within the cocoon must have died through the lack of warmth that their mother's body would have furnished them, if she had remained alive.

But had they lived, there doubtless would have been a very large family of them; for the tarantula spider lays as many as one hundred eggs at one time.

And had this mother spider been permitted to hatch her brood in her own nest, instead of in a close wooden box, it is very likely that she would not have died; for some spiders of this kind have been known to reach the age of seven or eight years.

The home of this tarantula was in the southern part of the United States; but such spiders are often brought into northern markets, concealed among clusters of fruit, and so they may sometimes be seen and studied far away from their native haunts.

LINES TO A SPIDER.



PRAY, busy, hunchback friend,
To spin that pretty web? One
To copy such fine lace, so
Hand-woven, I might say, but

Spun out, instead, the wondrous
And with what cunning
the proof
In these strong silken
stretch across,

From side to center, bright as shining floss.

where did you learn
need not spurn
rare, complete,
that your *feet*

warp and woof;
skill—behold
threads, that



How innocent you seem, — how modest, shy ;
 I'm sure I should be caught were I a fly ;
 For when with luring tone you whispered low,
 " Please walk into my parlor," I should go.

Weave on, weave on, my patient, hunchback friend ;
 For soon your work, like mine, will have an end.
 But in your cunning craft I claim no share ;
 For I but spin a tale — you spin a snare.

DO YOU BELIEVE IT?

ONE day in summer time, I saw some boys very busily at work on the edge of a little stream.

As I came upon them, I noticed that they were putting some long, white horsehairs in the water, and were trying to keep them down with a large stone.

When I asked them why they did this, one of the lads promptly replied, " Why, don't you see? We are going to raise some hair snakes."

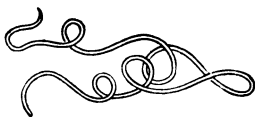
" Do you believe that you can do it?" said I.

" I know it," he answered, and went on with his work.

Now it is plain that some ignorant person had told these boys that hair snakes were produced in

that manner; for say what I might to the contrary, the lads would not listen to me.

The truth of the whole thing is this: The hair worm—for it is not a snake—lives mostly in the bodies of certain insects, such as the water beetle, the grasshopper, and the cricket; because the eggs of the worm are taken, by accident, into the stomach of the insect with its food and drink.



The Hair Worm.

But both the eggs and the worm have been known to pass through water pipes into the faucets of dwelling houses; and although such worms will not live in the human stomach, yet it is far better that drinking water should be carefully filtered before it is used.

I once saw a large grasshopper give a sudden leap, and then fall helplessly over upon his back. I picked him up by the head; when, lo, his head separated from his body!

As I held it up in my hand, there hung from it a very slender hair worm, several times the length of the insect. The worm had lain coiled up within his body, and had gnawed at his vitals until he died.

When these worms become full-grown, they leave the body of the insect and go to the water, where they lay their eggs in a long chain.

And it is at such times that we often see them in the water, looking like real hairs from the tail of a horse.

A strange thing about them is that they may be left in the hot sunshine till they are completely dried up, and until they appear to be dead; but if placed in water for a short time, they will come to life, and be as active as ever.

I have walked along the borders of that little stream many a time since that day, and have always found the heavy stone on duty, holding the horse-hairs down.

But alas! if those simple-hearted lads live long enough, they will find that their labors were in vain; for those hairs were never so much alive as when they were actively employed in brushing off flies and other insects from the poor horse's back and sides.

WINTER FRIENDS.

I. THE CHICKADEE.

Do you know the little titmouse
 In his brownish-ashen coat,
 With a cap so black and jaunty,
 And a black patch at his throat?

WHY yes, of course, we all know him; for he is the brave little chickadee that always has a word of

cheer for us, even in the coldest winter weather; and he is no more afraid of the ice and snow than we are.

His body measures about five and a half inches



The Chickadee.

in length, from the point of his short, black bill to the tip of his tail.

He wears a black, jaunty cap upon his head; but from the base of his bill there is a narrow white band that runs all along the sides of his neck. His pretty wings are also edged with white, while his slender legs are of a light-blue color.

And what an active, noisy little creature he is ! His loud twitter is full of sharp notes, but it can not well be called a song.

His mate wears a suit very much like his own, and she is quite as lively as he.

In summer time, she builds a nest of soft grasses and wool, and within it she lays six small, white eggs, marked with specks of red.



The Chickadee's Nest.

This nest is usually made in a knot hole on the limb or trunk of a tree ; sometimes it is a hole that a squirrel or some other animal has dug out and left.

But if the little chickadees can not find a hole of this kind, they will cut one in the tree, with their strong, sharp bills.

These birds like to flit about among the ever-green trees in winter, where they can pick up seeds, or draw forth a larval insect from its hiding place under the loose bark of the trunk.

So you see, these small winter visitors are our friends ; for they feed upon the hungry larvæ that destroy the fruit and foliage of our gardens and fields.

And now, in return for this good service of theirs, let us scatter a few crumbs here and there, upon the snow-covered ground. They will not be long in finding out where the feast is spread, and their little hearts will be gladdened at the sight; and I am sure that our hearts will be gladdened too, when we hear their sharp twitter of joy and surprise at such unexpected good luck.

II. THE NUTHATCH.

Do you know the pretty nuthatch in his suit of ashen blue,
 With his dainty bib of white, and his hose of modest brown?
 You may hear him sing, sometimes, though his notes are harsh
 and few;
 But you'll know him when you see him, by the black upon his
 crown.

This bird is a boon companion of the little chickadee; and they are often seen hopping about, side by side, trying to pick up an honest living wherever they find it.

The nuthatch is fond of rooming upstairs; so, in springtime, he finds a hole in the top of a tree, and there he helps his little mate build her nest.

Then she lays from four to eight white, rose-tinted eggs, specked with brown.

Under the bark of the tree, and among the cracks, he finds many a rare tidbit, such as the

eggs and the larvæ of different insects; so he often comes creeping down the tree, head foremost, in his search for them.

Sometimes he finds a small, broken acorn that has a plump grub inside of it; this he will crowd tightly into a deep crack of the bark, so that it will stay secure; and then he can easily pick out the choice morsel that he loves so well, when he wants it.



The Nuthatch on a Tree Trunk.

But if his mate is confined to her nest, he will carry the rich prize to her, instead of eating it himself. Is he not generous?

He is a cheerful little fellow, and sings quite as merrily among the branches of the leafless woods in winter time, as when he is sitting in some leafy bower on a bright summer day.

But when the trunk of the tree becomes smooth

and slippery, from frozen rain, then our little nut-hatch has quite a hard time of it; for he can not very well make his way along the smooth, icy surface of the trunk, neither can he get at the fat larvæ that are so safely shut in beneath their icy covering.

Then it is, that you may see him flying about the door, the barn or other outhouses, in search of a crumb to satisfy his hungry craving for food.

If he happens to find a fallen nut, he will soon break it open by means of the quick, hard strokes of his bill. But it is not the nut inside of the shell that he cares so much about; he knows when there is a fat maggot within it, and wants to get at that!

It is because of this habit of hammering, or hatching, the shells of some kinds of nuts, that he has received the name of "nuthatch."

III. THE RED-HEADED WOODPECKER.

Do you know that stylish fellow that stands rapping at the door

Of the helpless larval infants in that tree?

Now he turns his head and listens, then raps louder than before,

Just as if to say, "Why don't you answer me?"

That is the handsome red-headed woodpecker. He is clad in a suit of bluish black, trimmed with bands of white.

He wears a white vest, also, but his head and neck are clothed in crimson red. Is he not a beautiful bird?

With his strong bill he raps loudly upon the trunk of the tree; and as soon as he hears the larval insects within begin to move, he says to himself, "Ah, yes, I knew I was at the right door,— glad to find you all at home."



Red-headed Woodpeckers.

Then he forces an entrance with his bill, and darts in his long, barbed tongue.

He brings out a fat morsel every time; and the thievish jays that are searching about in vain for something to satisfy their hungry crops, look upon him with envy. If he were

a smaller bird, they would pounce upon him, and rob him on the spot. But they are afraid of him, so they leave him alone.

His mate wears quite as fine a suit as his own;

in fact, these red-headed woodpeckers are very handsome birds, clad in a three-colored plumage of red, white, and black, glossed over with a rich shade of steel blue.

They make their nests either in the body or in the limbs of a tree, and they do not line it with hair and moss, as most birds do; but they make it very smooth. In this nest, the mother bird lays six pure white eggs.

In winter time, they may be seen flying from tree to tree, and they are always very careful indeed not to chill their feet by lighting upon the snow-covered ground.

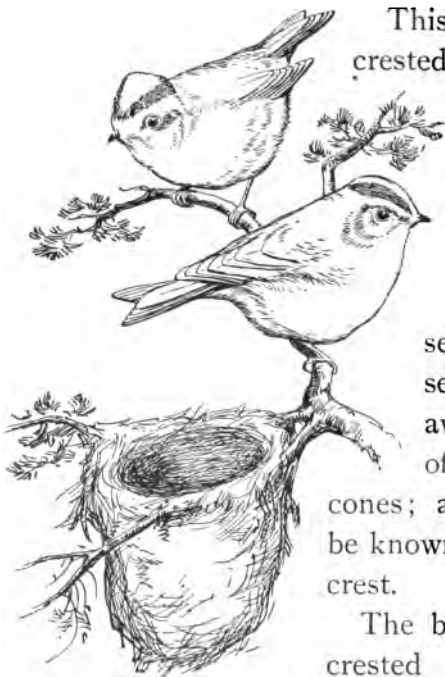
They are fond of making a dinner of larval insects; but they often seem to be quite as well pleased when they come upon a ripe, sweet apple, or a fine, juicy pear. They are easily contented, you see, and take whatever they can get.

They know, too, how to open the husks of the ripening corn with their sharp, wedge-shaped bills; for they like the rich milk that they find within its kernels.

But as these birds feed largely upon the insect world, we must look upon them as our friends; and so we will permit them to share with the chickadee and the nuthatch the scattered crumbs that fall from our table.

IV. THE GOLDEN-CRESTED WREN.

Do you know another bird with a black and golden crest,
 And a suit of olive green that is edged with brownish gray?
 There is white upon his forehead, and there's white upon his breast,
 For he loves the gayest colors, and he wears them every day.



This beautiful golden-crested wren is often found in winter upon evergreen trees, such as the spruce, the cedar, and the pine.

He is generally in search of the larval insects that lie hidden away under the scales of the evergreen cones; and he may always be known by his fine, golden crest.

The body of the golden-crested wren is fully four inches in length, and his mate is very nearly the same size.

She likes to build her nest upon the leafy branch

Golden-crested Wrens and Nest.

of an oak; but sometimes it may be found upon the bough of a fir tree.

The little, round nest of this wren is very neatly made. It is covered entirely over with moss; but there is a small hole at the side of the nest for an entrance. It is lined with soft down, and within it the mother wren lays from six to eight pure white eggs, specked with red.

V. THE BROWN CREEPER.

Do you know the little creeper, in his
garb of reddish brown,
Having narrow bands of white upon his
earlaps and his crown?
With the feathers of his tail finely edged
with brownish yellow,
And a vest of silky white, — do you
know this dapper fellow?

He is another boon companion of the chickadee; and he is well named, as you would say, could you see him creeping round and round a tree, in his journey toward the top.

The truth is, he finds so many good places on the way to lunch at, that he can not well pass them by; for the bark of the tree is filled with choice dainties.



The Brown Creeper.

And very often this bird will build a nest between a piece of loose bark and the body of the tree, where he can have a well-spread table always at hand.

His mate lays six small, grayish eggs, spotted with light brown; and the baby creepers that are hatched from them very quickly learn the ways of their parents, and travel up and down the tree as soon as they can leave the nest.

VI. THE DOWNY WOODPECKER.

Do you know a little bird that in mourning shades is dressed,
 Black and white upon his wings, black and white upon his head —
 Underneath, a bib of white on his pretty throat and breast;
 While above, upon his nape, gleams a shining bow of red?

This is the suit that the downy woodpecker wears, and his mate is clad in about the same style, except that she does not wear the flaming red ribbon on her neck.

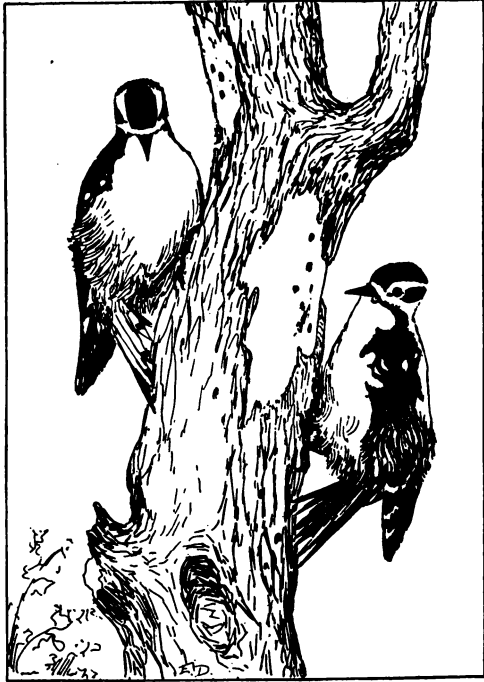
These birds are fit companions for the others that I have told you about, for they do not seem to mind the cold weather in the least.

Both the male and the female are carpenters by trade; so they will not content themselves with a deserted nest. They build a snug little home of their own.

They generally select a fruit tree of some sort, and they seem to like a cherry tree as well as any.

The male begins the work by cutting a round hole in the body of the tree with his strong bill; and when his good little mate sees that he is getting tired, she turns in and helps him.

They build a roomy nest, sometimes a foot or more in depth, and leave the door of the house just wide enough for each of them to pass in.



Downy Woodpeckers.

Like all carpenters, they make a good many chips; and these they carry away, and then scatter them at quite a distance from the tree so that no one will find out where their nest is hidden.

The bottom of the hole is made very smooth, and upon this, six pure white eggs are laid. This curious house is very neat and comfortable, but the dear little builders are not always permitted to enjoy it, as you will see.

For now I am obliged to tell you something very bad about the house wrens.

These birds will often watch the little woodpeckers till they have made quite a large hole in the body of a tree; and then they will drive them away from it, and take possession themselves.

The poor little birds fight for it as long as they are able, but they are finally forced to give it up.

I am very sure that their little friends, the chickadees, would help them defend it if they could; for they are not mere "summer friends," as you have already learned.

Do you know the house wren and his mate?

They are small birds, having a body not over five inches in length from the point of the beak to the tip of the tail.

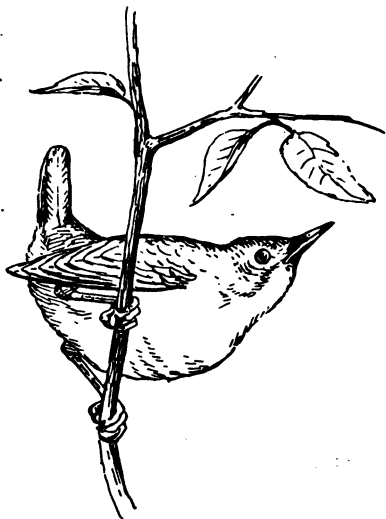
You would hardly believe that such little creatures could rob other birds of their nests, would you?

But the house wren does not belong to our list of winter friends, although he has a cousin, called the winter wren, that remains with us through all the long, cold winter.

The body of this little bird is hardly four inches in length. He is dressed in a plain, dark-brown suit, having a few black lines across the back; and these lines are touched here and there with dull white. Besides this, there are a few other small spots of white upon his body.

In his tail, which is short and erect, there are twelve feathers.

These birds may often be seen about the dooryard, or flying about the barn and outhouses, in search of crumbs, larvæ, or anything that will keep them alive through the cold months of the winter; and however hungry they may be, they keep up a cheerful twitter through it all.



The Winter Wren.

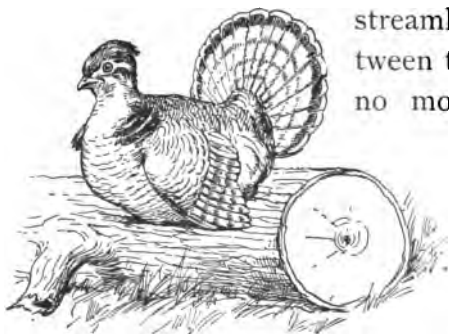
Now I have made you acquainted with only a very few of the little birds that stay with us during the winter months. But all of these are our friends; for they help us destroy the worms and insects that infest our gardens and orchards.

And should they come hopping about your door when the boughs are withered and bare, and the fields are covered with snow, I am very sure that you will not drive them away.

SNOW TRACKS.

I. THE RUFFED GROUSE.

It is midwinter, and the earth is covered all over with a counterpane of snow.



The Ruffed Grouse.

The silvery rills and streamlets glide along between their flowery banks no more; for they are locked up in strong, icy fetters, and Jack Frost carries the key.

Here and there a clump of weeds or grasses rises above the drifted snow, and a few frozen apples hang from the leafless boughs. But the birds with their keen eyes have spied the tops of the weeds, and they are going to make the most of them.

Here is a hungry fellow, clad in modest brown, with flecks of a lighter shade upon his raiment. In his broad tail there are eighteen reddish-brown feathers, tipped with gray.

He combs his hair straight back from his forehead, and wears a dark-colored ruff of broad feathers around his neck.

When he has plenty to eat he is a large, fine-looking fellow; but what a lean and bony creature he is now! He can find no insects, no ripe leaves, and no rich, oily seeds such as he feeds upon in summer time.

So he picks up whatever he can find, with a thankful heart, and only wishes he could get more.

When spring returns, he will sit upon the trunk of a fallen tree, and drum loudly with his wings; while his mate will find a close thicket of bushes and there she will make her nest.

This nest will be built of loose leaves, and within it she will lay from eight to twelve large, yellowish-white eggs. When her young ones are hatched out, she will lead them from place to place, where they can find plenty of berries and tender buds to eat; and if she fears any danger, she will give a loud cluck, in the same way that a mother hen calls to her chickens.

Then every one of the brood will hide from sight, in an instant, and it will be impossible to find them.

The name of this bird is the ruffed grouse, although it is often called a "partridge."

What do you suppose happened to some birds of this kind a few days ago? There came a dreary, stormy night, and the poor things had nowhere to sleep, so they made their bed in a deep snowdrift, thinking that it would keep them warm.

And so it might have done; but it rained during the night, and froze to a sheet of ice, and there were the helpless creatures locked within their bedrooms behind a strong, icy door! Was not that pitiful?

Now the very next time that you wish yourself a bird, with nothing to do but to fly from tree to tree, remember how much your feathered friends often suffer with cold and hunger outside, while you have comfort and warmth within.

II. THE WOOD MOUSE.

Here are some tiny tracks that wind in and out among the forest trees, making little zigzag lines upon the surface of the snow.

At the foot of some of these trees, and sometimes higher up in the trunk, there are deep holes; and here the wood mice have stored away nuts and other choice tidbits for winter use.



How much wiser of you, little white foot, had you put your goodies all in one place; for see, there are large tracks mixed up with yours, and I greatly fear that you will find some of your storehouses empty.

It is a very easy thing to select the nuts that you have tried to crack, because you make such bad work of getting at the kernel.

If you were sharp, you would not gnaw a hole at both ends of the hard shell; there is no use in doing that. You had better watch the squirrel—and for more reasons than one.

He knows enough to gnaw a hole at the large end, then he can turn the shell upside down and let the kernel drop out.



But it will soon make very little difference to you; for there is a mottled owl in that tree yonder, and nothing can please him better than an

The Wood Mouse and the Owl.

early breakfast of field mice. He can wait, for he wears his thick, tufted ear muffs, and he does not mind the cold weather at all.

III. THE CHIPMUNK.

The chipmunk leaves his tracks on this snowy counterpane, too; but there are not very many of



The Chipmunk.

them, for his barrels and bins are pretty full, and he has no need to "browse" around in the winter for something to eat. He is too good a provider for that.

His home is built down deep in the ground, with a strong stone wall at his door, so that no robber can get in and molest him.

But whenever there comes a warm springlike day, he seems to find it out at once, and up he comes to see what is going on above ground.

Here he is now, whisking his round, narrow tail, and scampering lightly about upon the crusted snow, as happy as a boy on skates.

His eyes are large and bright; his small ears stand up erect; and he has a very pointed snout.

He is clad in a rust-colored suit, striped with black and yellowish-white lines. He wears thin black whiskers, and there is a small black spot upon his nose.

He is lively enough now; but when he first came up out of his burrow he seemed to be very glad indeed to sit still and sun himself upon that old maple stump.

But you should see the chipmunk family during the early fall; then they are all busily at work gathering nuts and other winter stores.

They have a small pouch inside of each cheek; and the nuts that they gather are carried inside of this pouch; and when the pouch can hold no more, they will take still another nut between their strong front teeth. In this way they are able to carry as many as four nuts at a time.

Once in awhile the young ones will dart off and chase one another along the fences and stone walls; but the careful mother soon calls them back with a sharp, quick chirp. This means that they must stay with her and finish their work.

Late in the fall the whole family disappear and go down into the safe burrow which they have made in the ground. They have food enough to last them till spring; and then they will come forth again, as full of fun and frolic as ever.

IV. THE RED SQUIRREL.

Ah, here are some tracks that look a good deal like those of our little chipmunk.

They were made by the chickaree, or red squirrel. He has received the name of "chickaree," because he makes such a loud chattering noise as he runs briskly about from tree to tree.



The Red Squirrel.

Both his head and his body are quite as large as the chipmunk's, but his nose is less pointed. His round, broad ears are covered with short hairs, and he wears thin, black whiskers that are a trifle longer than his head.

His long, flat tail, as well as the upper part of his body, is of a deep, reddish brown; but his throat, his chin, the inside of his legs, and all the under part of his body are white.

This red squirrel lays up large stores for his winter use; and as he has no cheek pouch like the chipmunk, he carries the nuts between his front teeth.

Both he and his mate may be seen in autumn getting nuts, seeds, the bark of trees, and food of

that kind, which they carefully hide away either in hollow stumps or under logs and brush heaps.

They are not very timid animals; and sometimes they will steal into storehouses, where there is plenty of grain, and make a nest there for their winter quarters.

These little squirrels are more brave than the chipmunk family, and they do not hide themselves so closely away in winter-time.

But the two animals are very nearly related, as you can see by their form and by their style of dress; in fact, they have been called half-brothers.

V. REYNARD, THE FOX, AND RANGER, THE DOG.

Here are the footprints of two cousins; but they are not very much alike either in their dress or in their habits.

One of them is named Reynard, the fox.

He wears a coat of reddish yellow; his nose and his ears are pointed, and he has a bushy tail that he may well be proud of.

His cousin is Ranger, the dog, and these snow tracks show that they have been running a swift race.

The dog's master is not far off; for listen, there is the crack of his rifle, and now poor Rey-

nard leaps, limping away, with the dog following close upon his heels.

If he can only get back to his den in the rocks, he will be happy; for home is the best place, after all, for anybody that is in trouble.



Reynard and Ranger.

As he speeds on, he leaves a bloody trail all the way behind him; but the dog has the best of it, and Master Reynard's handsome fur coat will soon be in the market, and it will fetch a good price, too.

As for his worthless carcass, the crows will be glad to pick that; for their hungry "caw caw" is already sounding in the distance.

Ah, Master Reynard, we might feel just a little sorry for you, if you had ever shown any pity for others; but you have not.

You are fond of stealing chickens, and of killing birds and mice; but like all other robbers, you do not like to be hurt yourself.

But then it is your nature to hunt for game; and you have no other way of getting a living. So, when we come to think it all over, we do pity your sad fate, after all.

VI. THE WEASEL.

But Reynard is not the only sly thief that leaves his footprints upon the snow; for the nimble-footed weasel has been abroad too. There is no mistaking the marks of those short feet.

And if these tracks were to be followed up, they would no doubt lead to some poultry yard not far away; for he is very fond both of eggs and of young chickens and birds.

He wears a white coat in the winter, with a tip of deep black at the tail; but when summer comes, he will put on a fine suit of reddish brown, with a yellowish-white vest to set it off.

In other words, the white hairs that make up his winter coat fall out; and as fast as they fall, the

reddish-brown hairs grow in to take their places; and when winter comes again, the dark hair falls out, and the white hair grows in.

Animals that shed their coats in this way can easily hide away from their enemies. In winter



The Weasel and the Bird.

their white fur can not well be seen among the snowdrifts; and in summer their brown coats are readily hidden by the low brushwood of the forest.

But as I have said before, the weasel is very nimble of foot, and is not easily caught at any season of the year.

He has a very long, slim body, a small head, and

a pointed snout; and when he is peering about, in search of prey, he curves his neck, in a snakelike manner that makes him look very ugly indeed.

This animal has many accomplishments. He is a swift runner and climber, a good swimmer, and I once saw a tame weasel that could dance.

VII. THE NORTHERN HARE.

Here are the tracks of the soft-footed creature, the hare, and she also changes her garments to suit the season; for now she is clothed in white.

And this color, like the weasel's, often helps her to hide herself away from her enemies; for she can conceal herself in a bank of snow very easily.

Her summer coat of brown hair shields her in the same way; for when she hears an enemy on her track, she leaps into a thicket of low bushes, and then it is not an easy thing to find her.

This timid, innocent creature makes her home in hollow stumps, in brushwood, and in holes in the earth, where she always prepares a nice, warm bed for herself and her babies to lie upon.

Hares are harmless creatures; and as they turn back their long, soft ears, and look at you with their great eyes, it almost seems as if they were trying to ask you to befriend them.

It is true that our garden plants sometimes bear the marks of their sharp, chisel-like teeth ; but they will not stray far from the shelter of the forest if they can find any juicy thing to feed upon there.

They wander about at night, in search of food, and their long hind legs, and broad, furry feet enable them to pass very swiftly over the snow-



The Northern Hare.

covered earth ; sometimes they hunt under the snow, to find the leaves and the berries that are hidden there.

When they hear a noise, they stamp upon the ground with their hind feet,

and then leap into a thicket of bushes and hide themselves.

But the hare family have some enemies from which they very seldom escape ; these are the hawk, the owl, and the weasel.

So when these poor creatures wander about on a cold winter night in search of a bud or a leaf to keep them from starving, they are likely to be

seized upon at any moment by one of their fierce enemies, and destroyed on the spot. Is it any wonder that they are so timid?

VIII. THE MUSKRAT.

The fur-clad builders of those grass-roofed huts along the creek, yonder, have also left the marks of their feet upon this snowy counterpane.

These are the hardy muskrats whose front doors open into the water. They have stout, thickset bodies, and are not quite as large as the hares. They have very small eyes and small ears.

They are homely animals, clad in coats of coarse, dark-brown fur, filled in with shorter, finer hair. Their long, scaly tails are quite flat, and are almost naked.

They are not afraid of the water, for their feet are webbed and well made for swimming. In fact, they are very fond of diving and swimming; and a large number of them will often make a quick plunge at once, and play about together in the water for hours at a time.

When they go to their huts, they swim very near to them, and then dive down under the water and go in at the entrance.

They go about at night in search of food, and

they generally gnaw the roots and stems of plants that grow along the edge of the stream on which their homes are made.

But they can not always find what they like best in winter time, and then they must eat such food as falls in their way.

It is plain that they have made more than one



The Muskrat.

visit to that old apple tree that stands on the edge of the forest; for the frozen fruit lying upon the ground bears the marks of their sharp teeth.

One might suppose that eating so many hard, frozen apples would give them all the toothache; but since there are no juicy roots and grasses for them to feed upon, they must take whatever they can find, or starve.

But these animals are used to hard fare; their

homes are built of sods and coarse grass, and they have no soft, warm beds inside, such as the birds make up in their nests.

And yet, they are wise enough to build their huts so high that should the water of the stream rise above their low, mud floors, they can climb up into the loft and nest there. The mother muskrat often has as many as six babies in one nest, and she and her young family generally sleep upstairs.

IX. THE GRAY SQUIRREL.

And now we come upon the tracks of a gray squirrel, and what very long leaps he has taken! But his footprints were all made in the daytime; for he loves his warm nest too well to go forth into the darkness of a cold winter's night.

His nut bins are generally not very well filled; but even if he does run short of stores in the winter, he never seems to grow lank and lean like his cousin, the red squirrel.

It may be that his large, bushy tail gives him a well-fed and thrifty appearance; for "fine feathers make fine birds," we are told.

There is a large family of animals called rodents. "Rodent" means "a gnawer," that is, an animal that gnaws the food upon which it feeds, such as

the wood and the bark of trees, the hard shells of nuts, and things of that kind.

Now our handsome gray squirrel belongs to this family of rodents; and so do the red squirrel, the chipmunk, the mouse, the hare, and the muskrat.

These rodents are armed with strong teeth; and their four front teeth are very sharp. There are two of these teeth in each jaw; and they are shaped like the edge of a chisel.

The more these chisel-shaped teeth are used, the sharper they become; and they never wear out, for the growth is always being renewed from the roots.

No wonder, then, that these animals are so fond of nuts; for they carry four strong nutcrackers with them wherever they go.

Do you know the gray squirrel when you see him? He wears whiskers that are longer than his head, and his nose is somewhat blunt, like that of the red squirrel.

His cheeks, his nose, and his pretty round ears are of a yellowish-brown color; and there is a stripe of the same shade along his sides. There is also a dull stripe of brown running from the top of his head to his tail. His neck, sides, and hips are of a light gray color, and most of the hairs in his long tail are gray.

In summer weather, these gray squirrels make

nests for themselves in the forks of a tree; their nests are made of small twigs and of leaves, and are lined with moss.

These light, airy nests are their summer homes; but when winter comes on, they seek a more secure shelter in the deep hollow of some decayed tree. Sometimes as many as five or six baby squirrels may be found in these holes in early springtime, and when caught, they are very easily tamed.

If they are put into a cage, having a wheel inside of it that will roll round and round whenever they climb upon it, they will keep it moving an hour at a time.

In fact, they seem to be quite as happy when confined in their wheeled cages as they are when leaping among the leafy branches of the forest trees.

But they never lose the habit of laying up a store of food for winter use; and when food is placed in the cage, they eat a portion of it, and hide the rest of it away under the straw matting of the cage.

Are they not much wiser than some people in thus storing up a morsel for a rainy day?



The Gray Squirrel.

Now we might go on, and follow these snow tracks for miles and miles, and find in every footprint an interesting story of the little animal that made it.

But since I have guided you so far on the way, I am quite sure that you will be able to pursue the rest of the journey by yourselves.

It will take you a long time to come to the end. In fact, I am afraid that you will never quite reach it. But whether you thread your way through the pathless forest in the long, bright days of summer; whether you wander beside the margin of some small river or pond; or whether you follow the curious tracks that are left upon the newly-fallen snow, I do not believe that you will ever grow weary of the journey. For every day will afford you new sights and fresh scenes that will amply repay you for all your toil and trouble.

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